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Method for Assessing the Heritage Value of Net Fisheries

Science Report SC030212



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AGENCY**

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This report describes a pilot study to develop a method for evaluating the heritage value of net fisheries. It is for information only and will mainly be of use to those Fisheries staff in whose areas the quoted fisheries are situated.

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Science at the Environment Agency

Science underpins the work of the Environment Agency, by providing an up to date understanding of the world about us, and helping us to develop monitoring tools and techniques to manage our environment as efficiently as possible.

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Professor Mike Depledge Head of Science

Executive Summary

Method and sample

A study was undertaken in March/April 2004 to develop a method for evaluating the heritage value of net fisheries. The study identified preliminary estimates of the heritage value of the salmon fisheries under consideration.

The contingent valuation technique was utilised in this instance to establish the general public's willingness to pay (WTP) to:

- a) maintain the minimum level of traditional fishing methods; and
- b) maintain the current level of traditional fishing methods on the River Severn estuary and the Welsh coracle fisheries on the R. Tywi, R. Tâf and R. Teifi.

392 interviews were conducted with members of the general public in 3 location categories:

- a) Category 1, close to the river estuary: Carmarthen, Cardigan, Lydney and Sharpness;
- b) Category 2, near to the river, but away from the estuary: Shrewsbury, Tewkesbury, Newtown and Lampeter; and
- c) Category 3, away from the rivers: Birmingham, North Wales, Chester and Reading/Slough.

Awareness of the River Severn, River Tywi, River Tâf, River Teifi and traditional salmon fishing methods

Awareness of the River Severn was high. The majority of the total sample (95%) had heard of the River Severn, whilst 68% had visited (or at least travelled through) the area between Gloucester and the M4 bridge near Bristol i.e. the area in which the fishery is located. Awareness of the Welsh rivers was substantially lower than that for the River Severn. The Welsh rivers that generated the greatest awareness were the Tywi (58%) and the Tâf (55%). The Teifi (42%) was the least well known. Between 25% and 28% of the total sample had visited each of the Welsh rivers.

Although the majority of respondents could not name any traditional fishing method without prompting over 1/3 actually did so. 15% of all those interviewed mentioned lave nets, 11% draft or seine netting and 11% coracles. The proportion aware of any method rose from 37% to 63% on prompting with a list of traditional fishing methods. Prompted awareness of coracles was recorded at 45%, followed by draft or seine netting at 28%. It is possible that the high level of awareness for coracles may be related to awareness of the boat itself rather than the traditional fishing method, for example, Shrewsbury Town Football Club used to use a coracle to retrieve the ball from the Severn.

Only small proportions of the sample had seen the traditional fishing methods on the Severn or the Welsh rivers (approximately 10% in each case). Awareness was generally greater in locations close to the estuaries.

Willingness to pay

24% of the total sample indicated that they were willing to contribute an amount to maintain the minimum level of traditional fishing on the River Severn estuary and the 3 Welsh rivers.

The willingness to pay (WTP) fell from 37% in category 1, to 26% in category 2 and to 18% in category 3. There was no significant difference in the proportion of respondents willing to contribute between location categories 1 (close to the estuary) and 2 (away from the estuary but near to the river). There was however a significant difference between location category 3 (away from the rivers) and category 1 (close to the estuary). There does therefore appear to be some relationship between WTP and distance away from the river. Larger sample sizes may have shown a clearer relationship.

Although 24% of the total sample were willing to donate to maintain the minimum level of traditional fishing methods just 3% were willing to donate an amount in addition to this to maintain the current level.

The average WTP for the minimum level was £12, whilst the average for the additional amount was £8. These are the respective consumer surplus amounts for the minimum level, and additional utility for the current level of traditional fishing, for the relevant sub-sets of respondents. It is the utility that these respondents derive from knowing that traditional fishing methods are used on the Severn and the three Welsh rivers. It represents the benefit that they currently derive, but for which they currently do not have to pay; and it is the amount that they would be willing to pay rather than see traditional fishing disappear on these rivers. Please note that WTP is based on a one-off donation.

The low level of WTP an additional amount to maintain the fisheries at the current level, suggests that the preservation of the fishing methods on the rivers is the issue and not the level at which they are operating.

Respondents were asked to allocate points out of ten to the River Severn estuary and the Welsh coracle fisheries according to how they wished their donation to be allocated. The majority of respondents allocated equal points to the Welsh rivers and the River Severn, suggesting they valued them equally. The average score for the River Severn was 5.1, compared to an average of 4.9 for the Welsh rivers. There was no significant difference between the two means. Although base sizes are small there is evidence to suggest that respondents living close to a particular river valued that fishery more highly.

Heritage value

The estimated heritage value for the Welsh coracle fisheries within Environment Agency Wales (based on a one-off donation to maintain the minimum level of traditional fishing methods) is £1.5m. The estimated value for the River Severn estuary fishery amongst households within the Midlands region, North Wessex area and Thames West area is £5.3m.

Interest in seeing the traditional methods

On the whole there was a reasonable level of interest in visiting the River Severn to see the traditional fishing methods (38%).

Interest in visiting was higher amongst respondents who fished or had someone in the household who fished compared to those who did not. Members of an environmental group were more interested than non-members.

Interest in visiting the Welsh rivers to see the traditional fishing methods (37%) was similar to that for the River Severn. The ABC1's were more interested in visiting the Welsh rivers than the C2DE's, which bodes well for the level of income likely to be generated through tourism.

Interest in seeing the fishing methods was generally greater in areas close to the estuary and higher amongst those WTP to maintain the minimum level.

On the whole respondents believed it was important that traditional materials were used to maintain the coracles and putcher ranks (27% very important, 30% fairly important). Again perceived importance was greatest amongst those closest to the rivers.

There is thus an opportunity to maximise the value associated with the fisheries by enabling locals and day visitors particularly, to see demonstrations and examples of the traditional methods both on the rivers and in visitor centres. The use of traditional materials is likely to add to the authenticity and level of interest. There is also potential for a local educational role through schools for example, given the high level of local interest in the fishing methods. Higher interest amongst anglers and members of environmental groups offers opportunities for promoting the fisheries through the rod licence database and via other conservation and environment related organisations.

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1 Introduction and objectives

All data within this report relates to a contingent valuation survey undertaken for the Environment Agency during March 2004.

The overall aim of the project was to develop and test a methodology that can be used to investigate the heritage value of net fisheries.

The Environment Agency wished to test a contingent valuation methodology designed to provide a preliminary estimate of the heritage value of the River Severn and Welsh coracle fisheries. The heritage value was to be derived by determining how much members of the public would be willing to pay in order to maintain the minimum and current levels of traditional salmon fishing methods on the River Severn and Welsh coracle fisheries. The Welsh coracle fisheries comprised fisheries on the River Tywi, the River Teifi and the River Tâf.

The study was conducted by ADAS Market and Policy Research in association with Ken Willis, Professor of Environmental Economics at Newcastle University. Ken Willis provided guidance and expertise in relation to the contingent valuation technique, whilst ADAS co-ordinated and undertook the survey design, fieldwork, analysis and report writing.

2 Method and sample

The contingent valuation (CV) technique was utilised in order to determine the general public's willingness to pay (WTP) to:

- a) maintain the minimum level of traditional fishing methods on the River Severn estuary and the Welsh coracle fisheries on the R. Tywi, R Tâf and R. Teifi.
- b) maintain the current level of traditional fishing methods on the River Severn estuary and the Welsh coracle fisheries (2003 season).

2.1 Development of the CV questionnaire

The study was conducted via telephone for cost effectiveness.

Two questionnaires were developed, the first identified as the "screener" aimed to recruit respondents to the CV process and collect key information that would enable detailed analysis and interpretation of the WTP data. The screener collected:

- demographics
- awareness and visit levels for the rivers
- awareness of the traditional fishing methods
- current fishing behaviour
- membership of environmental groups

The second questionnaire identified as the "follow up" questionnaire followed the format of a typical CV questionnaire and comprised the following elements:

- the CV scenario and payment vehicle
- WTP questions, utilising a payment ladder modified for use over the telephone
- follow up questions to identify potential sources of prejudice or bias within the WTP responses and also
- interest in visiting the fisheries and importance of utilising traditional materials for coracles and putcher ranks.

The Welsh rivers were pronounced phonetically during the interview to avoid confusion and misunderstanding. In particular, confusion between the Tâf and Taff (in Cardiff) was a potential problem, which the phonetic pronunciation aimed to avoid.

Fisheries information

A series of pages were prepared by the Environment Agency which included photographs and descriptions of the traditional fishing methods on the River Severn estuary and Welsh coracle fisheries. This information was mailed to respondents to provide information on which to base their WTP.

Pilot

The two questionnaires and fisheries information were piloted during a focus group amongst ADAS employees unfamiliar with this project and the CV technique. Often a pilot would be conducted amongst a focus group of members of the general public,

however cost and time restraints did not permit this for this project. A pilot amongst approximately 8 members of the general public was also conducted by telephone. The pilots aimed to test the flow of the questionnaires, understanding of the CV questions and fisheries information and suitability of the start and end points for the payment ladders.

2.2 Interview process

The interview was conducted in three stages:

- Screener questionnaire conducted to recruit respondents and collect initial data
- Fisheries information sent by post to the respondent's home, to be read prior to a follow up interview
- Follow up contact and interview at a prearranged date and time.

The telephone interviews were conducted by a specialist agency using Computer Assisted Telephone Interviewing (CATI).

Contact names and telephone numbers for the survey were sourced via a specialist agency. The initial screening interview lasted approximately 5 minutes and the follow-up interview about 10 minutes.

2.3 Fieldwork and data processing

The fieldwork aspect of the project was undertaken by The Hill Taylor Partnership who specialise in providing quality telephone-based fieldwork and are experienced in using QPSMR, the research and data analysis software used by ADAS Consulting Ltd.

Computer-Aided Telephone Interviews (CATI) were undertaken using the QPSMR software. CATI systems enable data to be captured and recorded electronically. Interviews conducted in this way have a number of advantages over other methods, including:

- A geographically dispersed sample can be achieved more easily (including those in rural and remote areas);
- Quotas and samples can be monitored
- Interviewer performance can be monitored
- Checking and editing of the data is done automatically
- Interim results can be easily obtained
- Verbatim responses can be digitally recorded
- Automatic routing reduces errors
- Call backs can be easily managed thus reducing bias towards those most often at home
- Respondents offered a degree of perceived anonymity, which can help when obtaining data of a sensitive nature such as willingness to make a donation.

2.4 Sample

The sample comprised members of the general public. Respondents were recruited irrespective of their involvement in, interest in or knowledge of fishing, traditional fishing methods or the fisheries involved in the study.

In order to ensure the sample was broadly representative of the England and Wales population, quotas were placed on age, sex and social grade. The achieved sample contained a lower proportion of 16-34yr olds than was required, thus the data was weighted to bring it in line with the sample quotas.

Rim weighting was used to modify the sample data to make it more representative of the target population in terms of age. A weighting factor was applied to the variable related to age. The over-represented groups (35-54 years and 55 years +) were down-weighted and the under-represented group (16-34 years) was up-weighted.

To calculate the weighting factor, the population percentage was divided by the sample percentage. The sample percentage was then multiplied by the weighting factor.

The following table shows the target sample and achieved sample both before and after weighting. The weighting factors are also included.

Table 1: Sample distribution by gender, age and social grade

	Target sample	Sample achieved before weighting	Sample achieved after weighting	Weighting factor
Gender				
Male	49%	49%	49%	-
Female	51%	51%	51%	-
Age				
16-34 yrs	33%	25%	33%	1.32
35-54 yrs	34%	35%	34%	0.97
55 yrs+	33%	40%	33%	0.80
Social grade				
ABC1	52%	52%	52%	-
C2DE	48%	48%	48%	-

2.5 Location

The sample for the telephone interviews was distributed around the Welsh coracle fisheries on the River Tywi, River Tâf and River Teifi and the fishery on the River Severn estuary, and included Birmingham and extended as far east as the London suburbs and north as far as Chester.

The Environment Agency wished to understand the influence of distance from the fisheries on WTP, thus the sample locations were selected with this in mind. Proximity to the river estuaries was the key factor used to plan the sample distribution.

The location categories were as follows:

- **Category 1:** close to the river estuaries
- **Category 2:** away from the estuaries but near to the river
- **Category 3:** a good distance away from the rivers.

392 CV interviews were conducted in total, split across the 3 categories. The aim was to achieve sufficient interviews in each category to enable confident analysis of the data. 95 interviews were achieved in category 1, 99 in category 2 and 198 in category 3.

The areas included within the research were identified by postcode and agreed with the Environment Agency prior to the fieldwork commencing.

The following tables detail the interview locations, distance from the nearest of the 4 river estuaries and number of interviews per location.

Table 2: Sample distribution and distance from the nearest of the river estuaries

Category	Area	Post-code area	Nearest river	Distance to nearest river estuary*
Category 1 Close to the river estuary	Carmarthen	SA31	Tywi	6 miles
	Cardigan and surrounding area	SA43	Teifi	1 mile
	Lydney west bank area	GL15	Severn	5 miles
	Sharpness east bank area	GL13	Severn	3 miles
Category 2 Away from the river estuary, but near to the river	Shrewsbury	SY1, SY2, SY3	Severn	75 miles
	Tewkesbury	GL20	Severn	25 miles
	Newtown	SY16	Severn	67 miles
	Lampeter and surrounding area	SA48	Teifi	24 miles
Category 3 A good distance away from the rivers	Birmingham	B	Severn	67 miles
	North Wales	LL	Teifi	88 miles
	Chester	CH	Severn & Teifi	105 miles
	Reading and Slough	RG & SL	Severn	77 miles

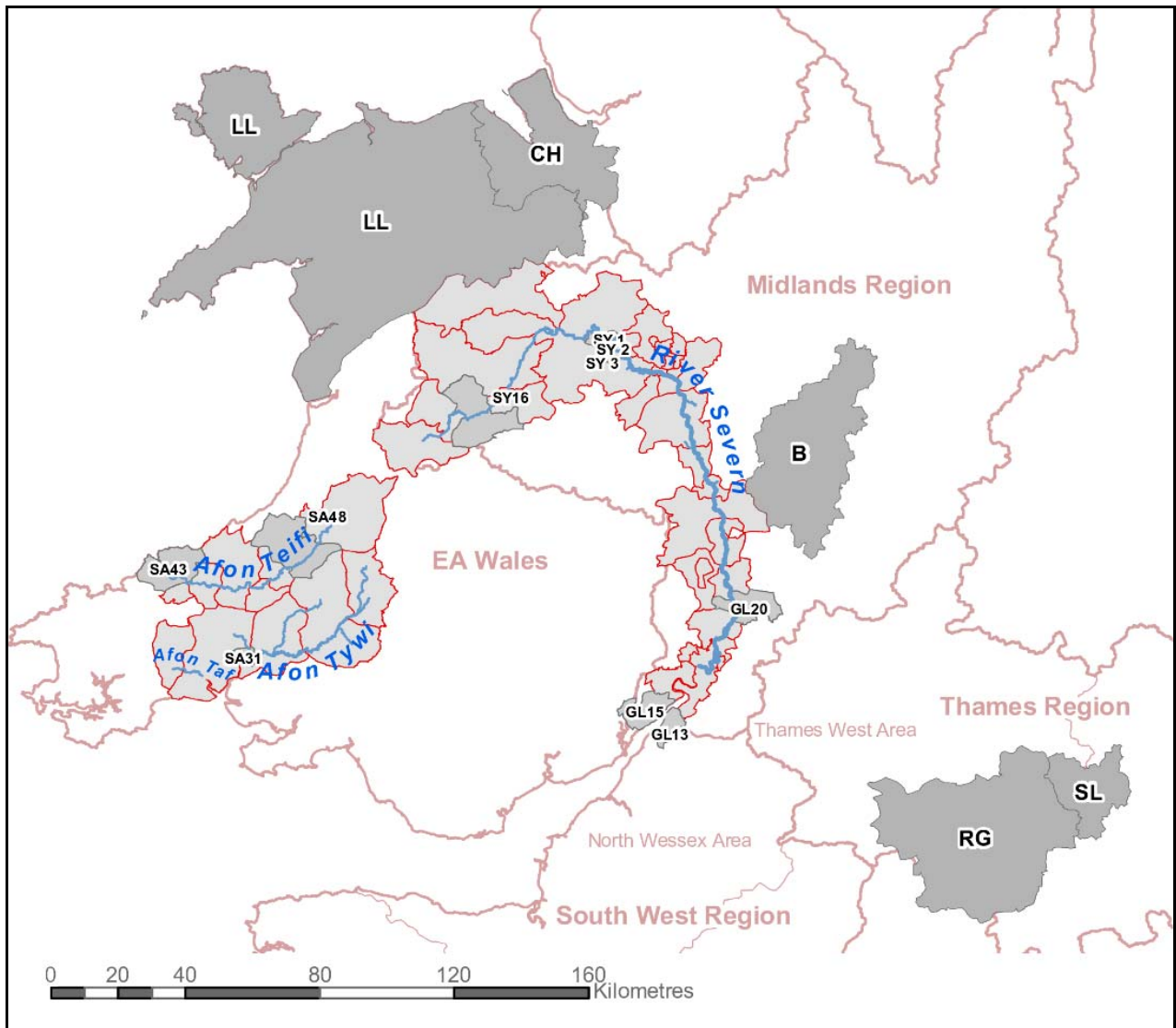
* Distance measured from approximate centre of postcode area or from area of main population if area primarily rural. Measurements taken as direct distance from point A to point B using the WHSmith Great Britain 2004 Road Atlas (Giant Scale, 2.5 miles to 1 inch)

Table 3: Sample distribution and number of interviews per location




Category	Area	Post-code	Target no. of interviews	No. of interviews achieved
Category 1 Close to the river estuary	Carmarthen	SA31	25	20
	Cardigan and surrounding area	SA43	25	26
	Lydney west bank area	GL15	25	23
	Sharpness east bank area	GL13	25	26
Category 2 Away from the river estuary, but near to the river	Shrewsbury	SY1, SY2 & SY3	25	19
	Tewkesbury	GL20	25	30
	Newtown	SY16	25	27
	Lampeter and surrounding area	SA48	25	23
Category 3 A good distance away from the rivers	Birmingham	B	50	48
	North Wales	LL	50	47
	Chester	CH	50	53
	Reading and Slough	RG and SL	50	50
TOTAL			400	392

The following map highlights the River Severn, River Teifi, River Tywi, River Tâf, sampling locations and also additional category 1 and 2 locations adjacent to the river. The additional category 1 and 2 locations will be used in calculations to estimate the value of the fisheries within Wales and England.

Figure 1: Location map



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Key:	
	Category 3 sampling locations
	Category 1 and 2 sampling locations
	Category 1 and 2 locations, not included within the interview sample

2.6 Mean scores

Mean scores were calculated during the data analysis for all rating scales. Values were attached to each response for those questions which required single responses based on a rating scale e.g. 'certain to' to 'certain not to'. In each case the highest value in the

scale was allocated to the most positive response e.g. 'certain to' and a rating of 1 was allocated to the most negative response e.g. 'certain not to'. The higher the mean score, therefore, the more positive the overall response. Responses such as 'no opinion' and 'don't know' were not included in the calculation of mean scores.

3 Potential sources of bias

Many measures were taken to reduce the influence of bias on the study, however the following sources of bias still exist:

A number of contacts refused to take part in the study or dropped out after receiving the fisheries information. A lack of knowledge or interest in fishing or fisheries was a key reason cited for dropping out of the study, despite repeated reassurances being made that this was not an issue. The inclusion of these respondents within the survey would have resulted in a lower WTP, compared to that actually recorded.

17% of all contacts refused to take part in the study.

13% of the 476 respondents who had been recruited to take part in the follow up study were unavailable or decided not to take part.

Ideally base sizes for individual locations within the study could have been larger to enable more robust analysis within the 3 broad categories, however this was not possible due to budget and time constraints.

Iterative bidding (IB) is advocated, over simple dichotomous choice WTP,¹ on the grounds that it will capture the highest price consumers are willing to pay, thereby measuring full consumer surplus (Cummings, Brookshire and Schulze, 1986). Where there is uncertainty about the parameters of the distribution, an IB design may be desirable compared to dichotomous choice bid designs. In addition the iteration process provides the respondent with more time to consider the value of the public good to him; and, if bid amounts increase monotonically in small regular amounts, more opportunities to reject a bid amount, compared with a dichotomous choice method that only presents the respondent with one or two bid amounts.

However, IB only establishes the interval within which the actual WTP amount lies,² thus any mean WTP calculated from the distribution is an (lower bound) approximation. Some researchers believe that a series of elicitation questions such as IB is more accurate and reliable than other procedures because it requires respondents to thoroughly search their preferences, provides more time to think, and more closely replicates a real auction.

The greatest potential bias in IB is starting point or anchoring bias. Anchoring occurs when the initial bid amount offered to respondents influences the individual's final WTP value for the good. People tend to believe the starting point suggested is the norm: what other people might reasonably pay, and therefore what is expected of them. If the respondent's answer to one bid amount influences his or her answer to the next bid

¹ In single bounded dichotomous choice (DC) WTP, respondents are asked (yes or no) if they would be willing to pay £X for the good. X is varied between respondents, perhaps over 4 or 5 values. In double bounded DC, after the first DC question has been answered, a second DC question is presented with (a) a higher bid amount if the respondent answered "yes" to the first DC bid; or (b) a lower bid amount if the respondent answered "no" to the first DC bid.

² E.g. if a respondent answered "yes" to £30 but "no" to £40, we know s/he is WTP at least £30 but a proportion of these respondents may have been willing to pay £31, £32, £33, . . . £39.

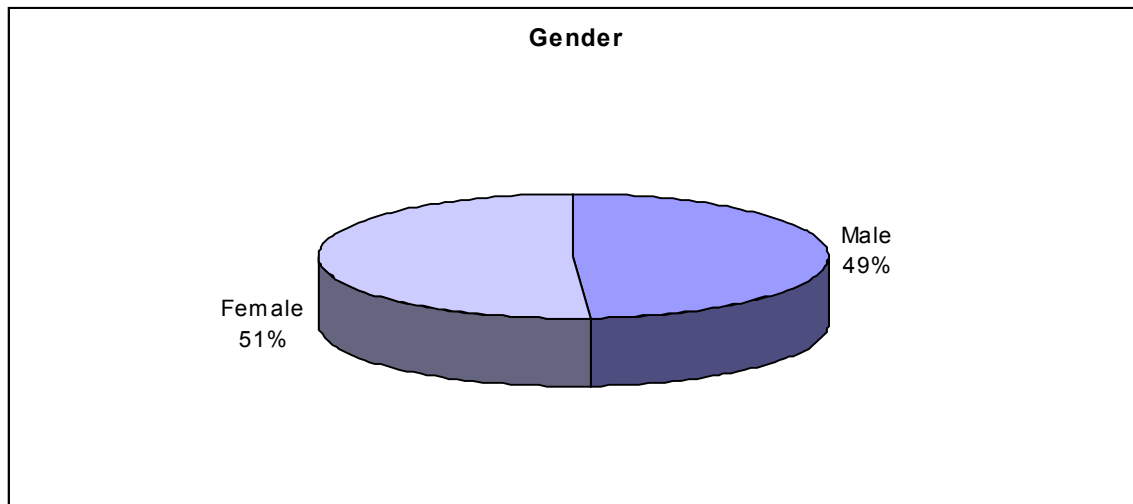
amount then an IB procedure is less likely to produce an accurate and robust estimate of WTP. Because the survey only had one IB table, the study could not test for anchoring bias in the starting bid. Such a test would have required three or four different IB tables with different starting bids, each to be presented to a sub-set of the sample. Nevertheless, there is reason to believe (see Figure 22 in the main findings) that the starting point was low, as exemplified by the fact that it was only when the bid level reached £2 that a significant decline in the proportion of respondents willing to pay the amount started to occur. Thus, the starting point of 50p is likely to have produced a 'conservative' estimate of people's WTP.

4 Main findings

The following sections of this document headed sample structure, awareness of rivers and awareness of traditional fishing methods report on data obtained during the screener interview.

4.1 Sample structure

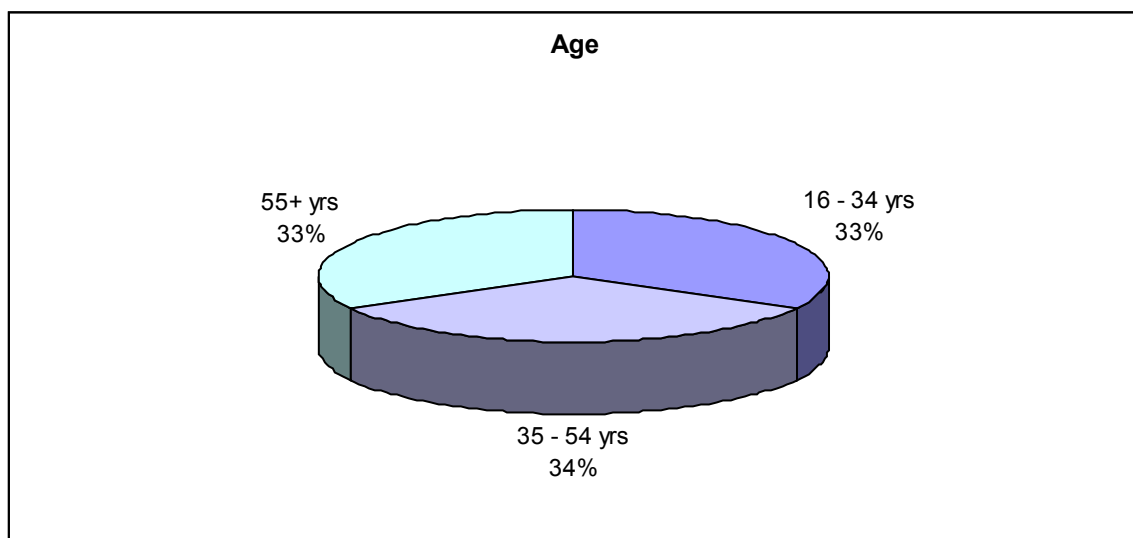
Fig 2: Gender



Weighted base: All respondents = 392
Unweighted base: All respondents = 392

In line with the England and Wales population profile, the sample comprised similar proportions of males and females.

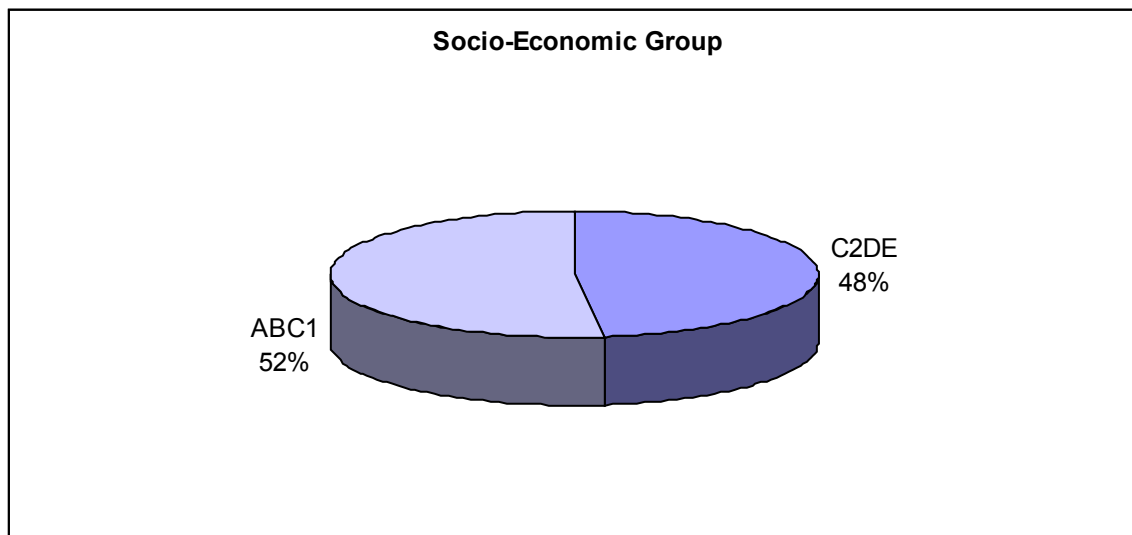
Fig 3: Which of these age groups do you fall into?



Weighted base: All respondents = 392
Unweighted base: All respondents = 392

The age profile of the sample was weighted evenly between 16-34yr olds, 35-54yr olds and those aged 55+yrs, in line with the England and Wales population profile.

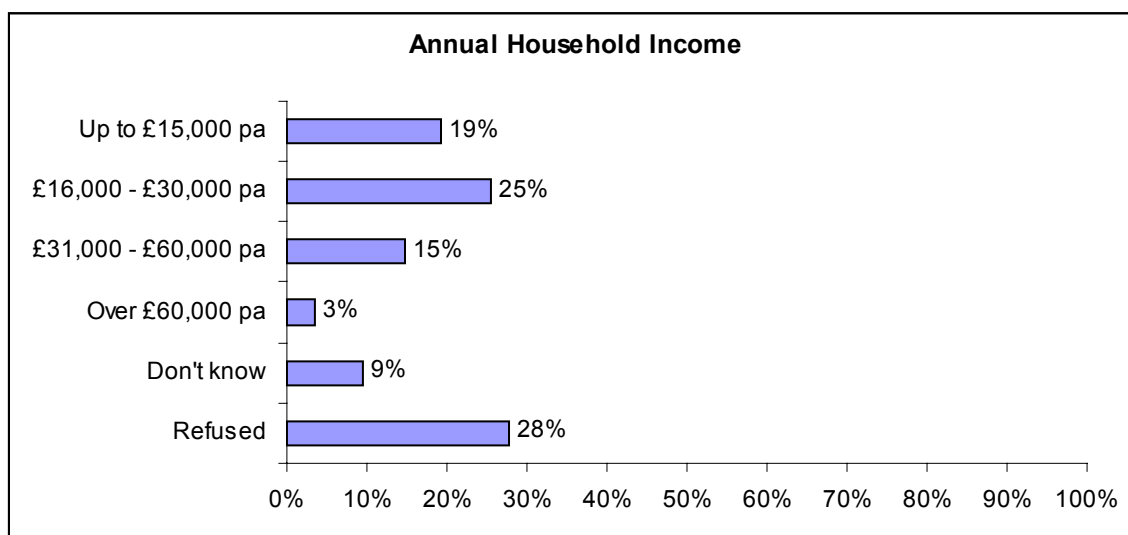
Fig 4: Socio-Economic Group



Weighted base: All respondents = 392
Unweighted base: All respondents = 392

In line with the England and Wales population the sample comprised 52% ABC1's and 48% C2DE's.

Fig 5: And which of these ranges best fits your household income?

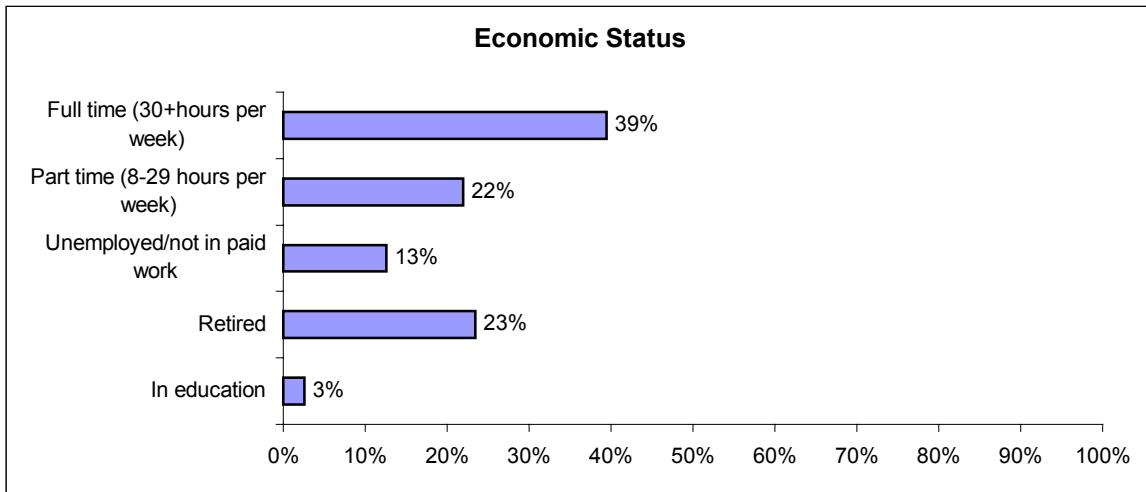


Weighted base: All respondents = 392
Unweighted base: All respondents = 392

19% of the sample had a household income of £15K or below, whilst 25% had an income of £16-£30K. A further 18% had a household income over £31K. Just over ¼ of the

sample refused to provide an answer to this question. This level of no response is not uncommon due to the nature of this question.

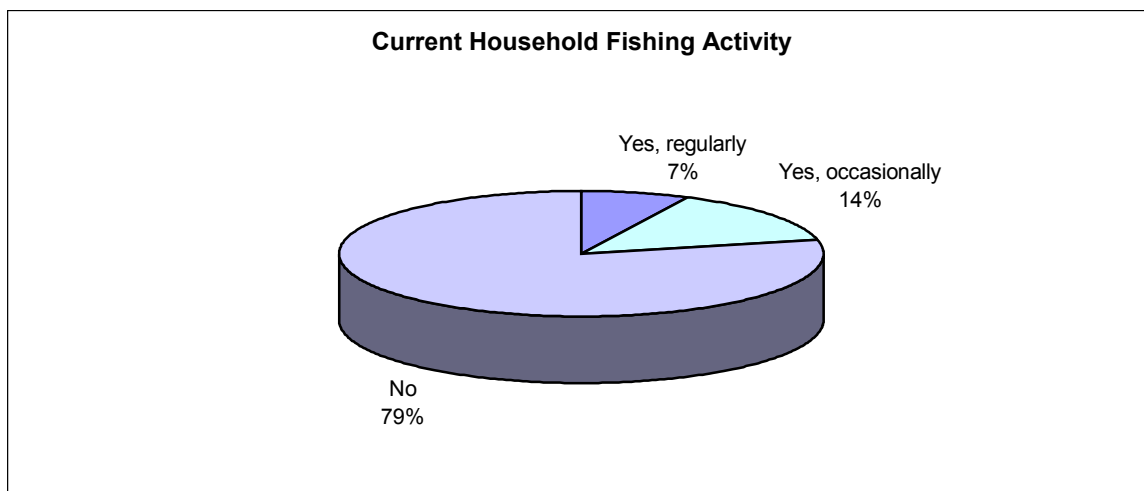
Fig 6: Do you work full or part time?



Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

39% of the sample were in full time work, whilst a further 22% worked part time. A high proportion of the sample, 23%, were retired. The latter figure appears high compared to the 13% recorded in the 2001 Census, however the level of employment was in line with the England and Wales census figure of 60%. It is possible that a number of the retired respondents in this sample are classified differently within the census data.

Fig 7: Do you or anyone in your household go fishing nowadays?

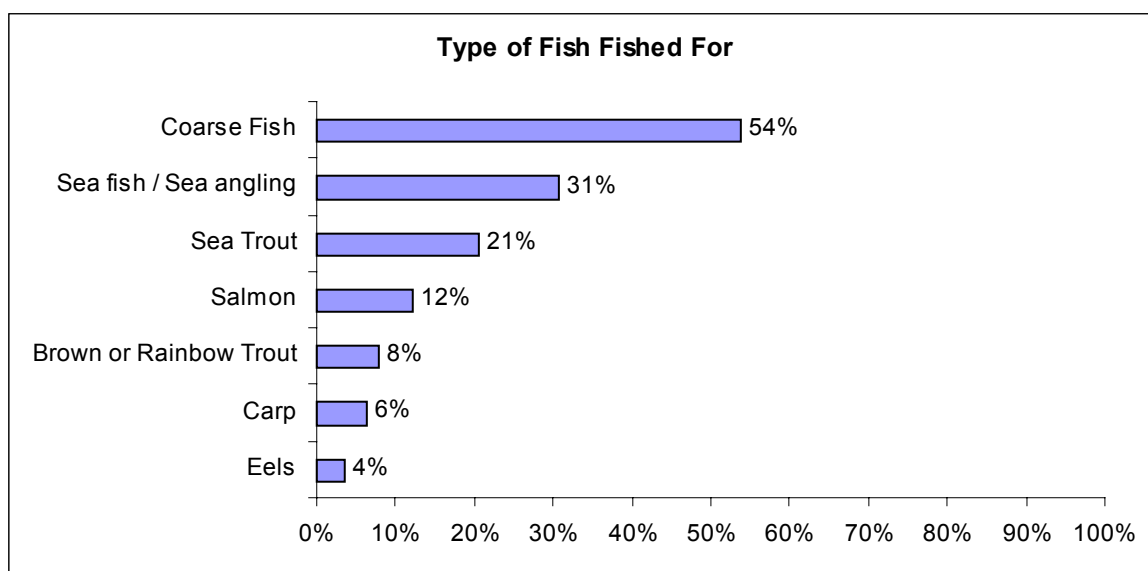


Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

21% of the sample either fished themselves, or had someone in the household who fished. This question was asked to enable greater analysis and interpretation of subsequent questions.

Locations such as Birmingham (17%), North Wales (15%) and Reading/Slough (18%) appeared to have fewer anglers than elsewhere, however differences were not significant.

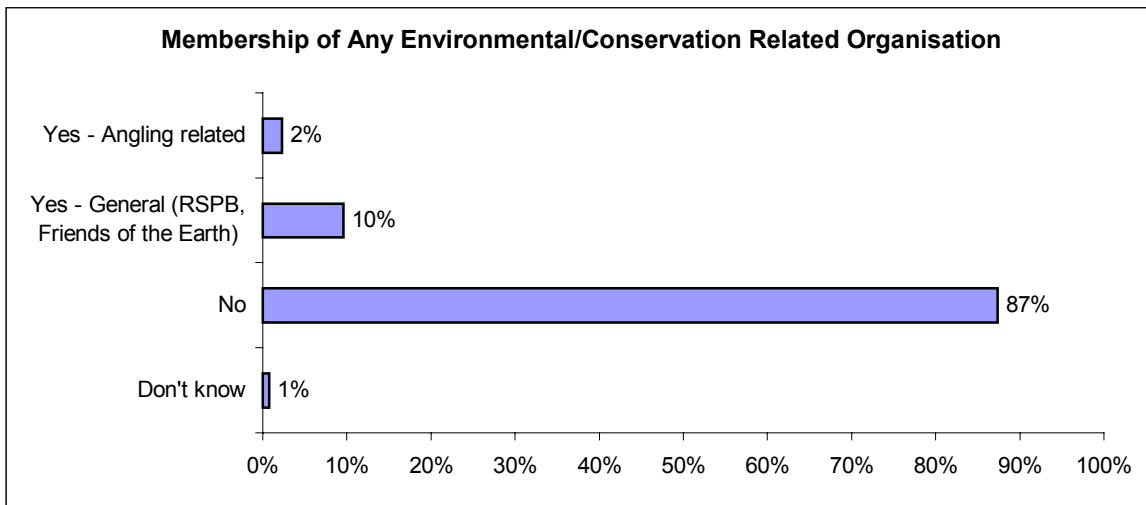
Fig 8: What type of fish have you/they fished for? (Multiple Response)



Weighted base: Respondents who fished/ had someone in their household who fished = 84
Unweighted base: Respondents who fished/ had someone in their household who fished = 80

Of those respondents who fished or had someone in the household who fished, over half fished for coarse fish. Almost $\frac{1}{3}$ went sea fishing, whilst $\frac{1}{3}$ were migratory salmonid anglers. The relatively high proportion of migratory salmonid anglers is likely to be due to the proximity of the salmon and sea trout fisheries to the interview locations.

Fig 9: Are you a member of any environmental or conservation related organisation?

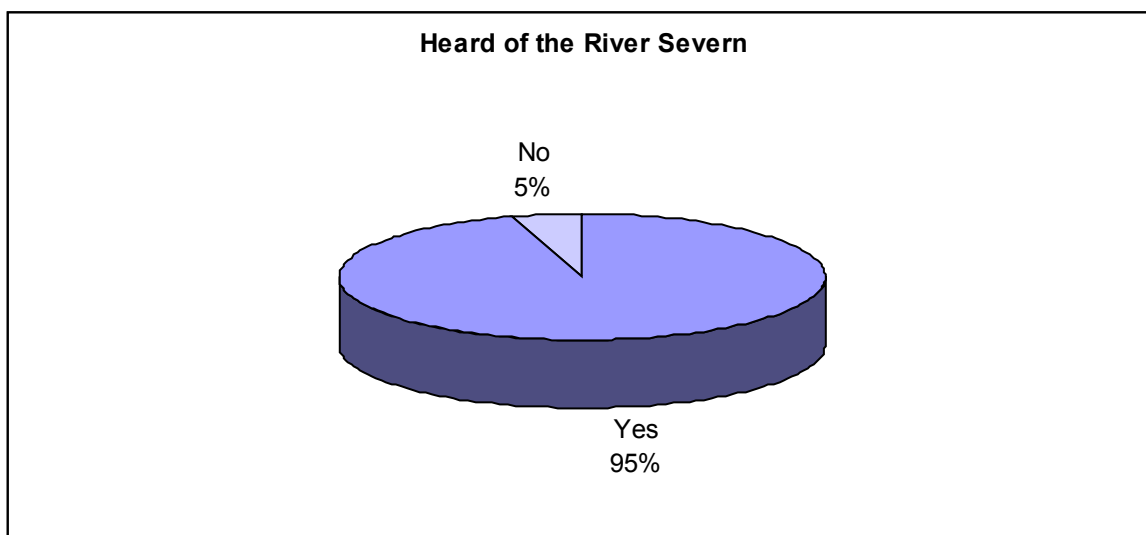


Weighted base: All respondents = 392
Unweighted base: All respondents = 392

12% of respondents were members of an environmental or conservation related organisation, with 2% being members of an angling related body. This information was collected to enable more detailed analysis of subsequent questions.

4.2 Awareness of rivers

Fig 10: Have you heard of the River Severn?



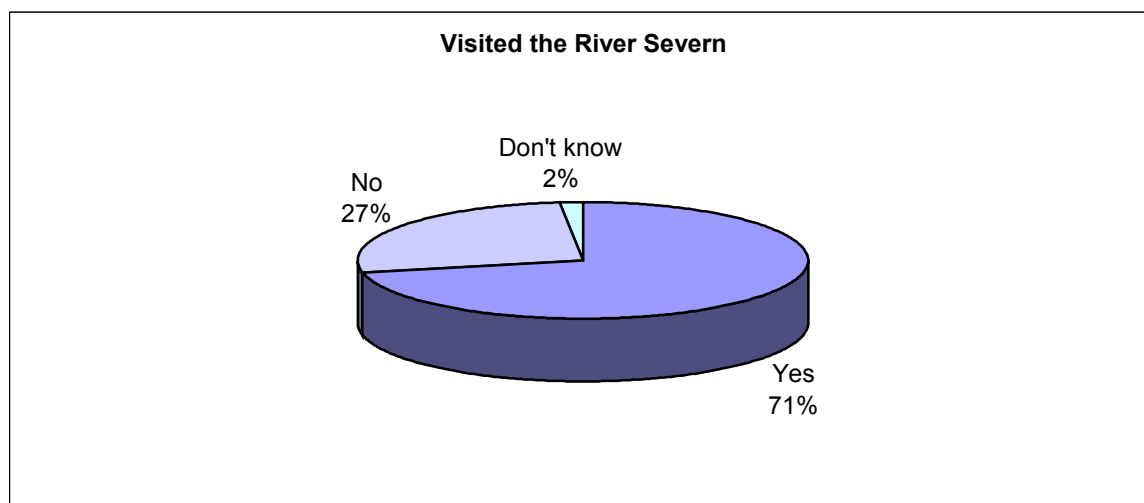
Weighted base: All respondents = 392
Unweighted base: All respondents = 392

The majority of the sample, 95%, had heard of the River Severn.

Awareness levels did not vary significantly by gender or social grade, however those in the mid age group (35-54yrs) showed significantly greater awareness at the 95% level than their counterparts, (16-34yrs 93%, 35-54yrs 99%, 55+yrs 94%).

Awareness levels of 100% were recorded in Lydney/Sharpness, Shrewsbury/Tewkesbury/Newtown and also Lampeter. Awareness levels for this river were still extremely high as far away as Chester and Reading & Slough.

Fig 11 Have you ever visited the River Severn between Gloucester and the M4 bridge near Bristol?



Weighted base: Respondents who had heard of the River Severn = 373
Unweighted base: Respondents who had heard of the River Severn = 374

Of those who had heard of the River Severn, 71% had visited (or at least travelled through) the area between Gloucester and the M4 bridge near Bristol. This represents 68% of the total sample.

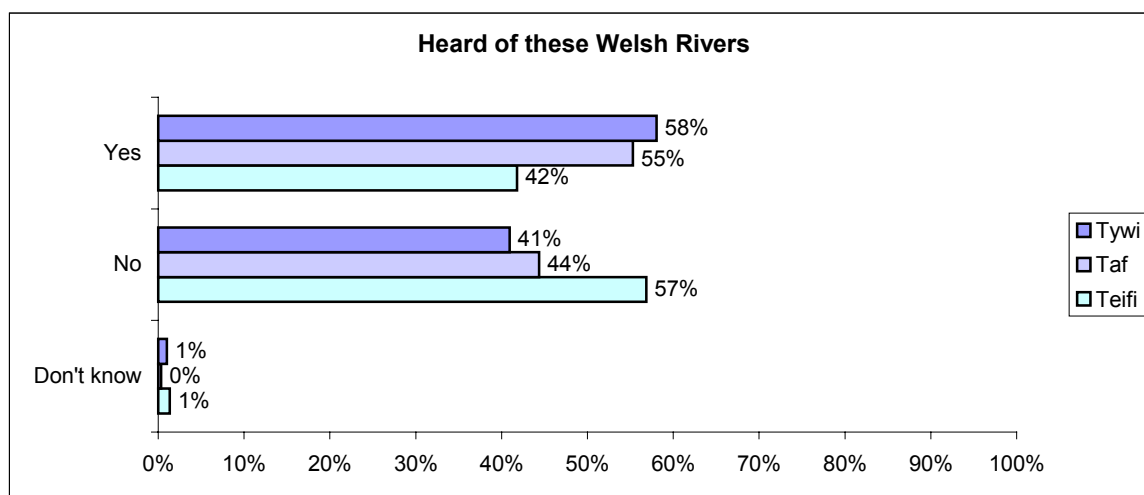
Likelihood to have visited this part of the River Severn was very similar amongst males and females and across the social grades, however there was some evidence to suggest that the likelihood increased with age (16-34yrs 65%, 35-54yrs 73%, 55+yrs 77%).

Unsurprisingly, amongst those respondents aware of the Severn, a very high proportion from Lydney/Sharpness (on the banks of the Severn estuary) and also Shrewsbury/Tewkesbury and Newtown had visited the Severn in this area. Half the respondents from as far away as Chester, North Wales and Reading/Slough had also visited.

Table 4: Awareness and visitation of the River Severn by location

	River Severn								
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrewsb'y, Tewkesb'y & Newtown	Lampeter	B'ham	N Wales	Chester	Reading & Slough
<i>Unweighted row</i>	392	46	49	76	23	48	47	53	50
<i>Total (Weighted)</i>	392	47	50	76	24	48	46	52	50
Aware	95%	93%	100%	100%	100%	90%	93%	92%	94%
<i>Total (Weighted) (only those aware of the R. Severn)</i>	373	43	50	76	24	44	42	48	47
Visited	72%	74%	95%	99%	70%	65%	51%	48%	48%

Fig 12: And have you ever heard of these Welsh rivers?



Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

Awareness of the Welsh rivers across the total sample was lower than that for the River Severn. The Welsh rivers that generated the greatest awareness however were the Tywi and Tâf. The Teifi was the least well known of these 3 rivers.

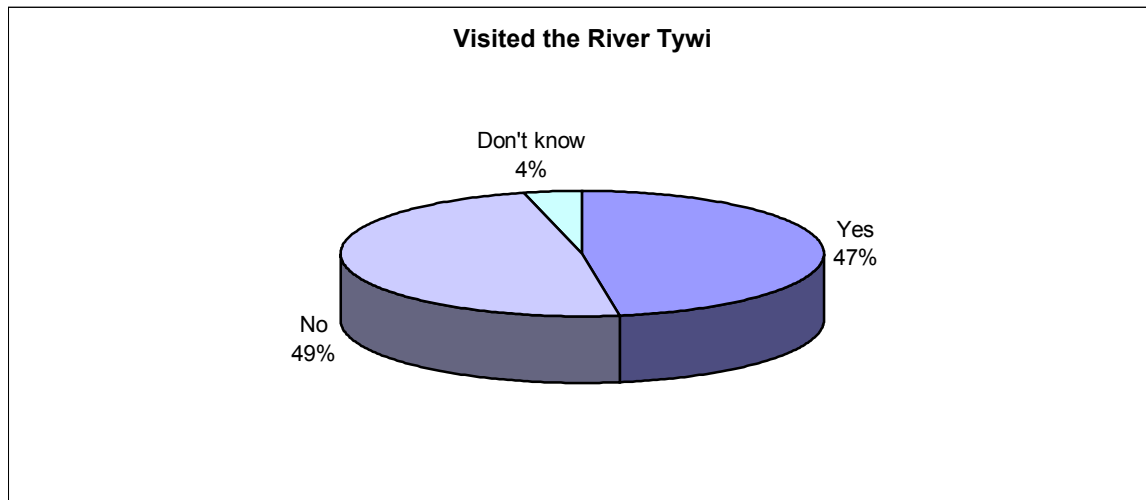
Generally awareness for all three Welsh rivers appeared to increase with the age of the respondents. Notable differences were not evident by gender or social grade.

Unsurprisingly awareness was greatest for all 3 Welsh rivers in Carmarthen and Cardigan, Lampeter and also North Wales. (See table 5).

Table 5: Awareness of the Welsh rivers by location

Awareness of Welsh Rivers									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrewsb'y, Tewkesb'y & Newtown	Lampeter	B'ham	N Wales	Chester	Reading & Slough
<i>Unweighted row</i>	392	46	49	76	23	48	47	53	50
<i>Total (Weighted)</i>	392	47	50	76	24	48	46	52	50
Aware of Tywi	58%	98%	54%	56%	100%	22%	84%	45%	33%
Aware of Tâf	55%	85%	48%	55%	85%	36%	74%	40%	38%
Aware of Teifi	42%	90%	40%	33%	100%	21%	61%	15%	15%

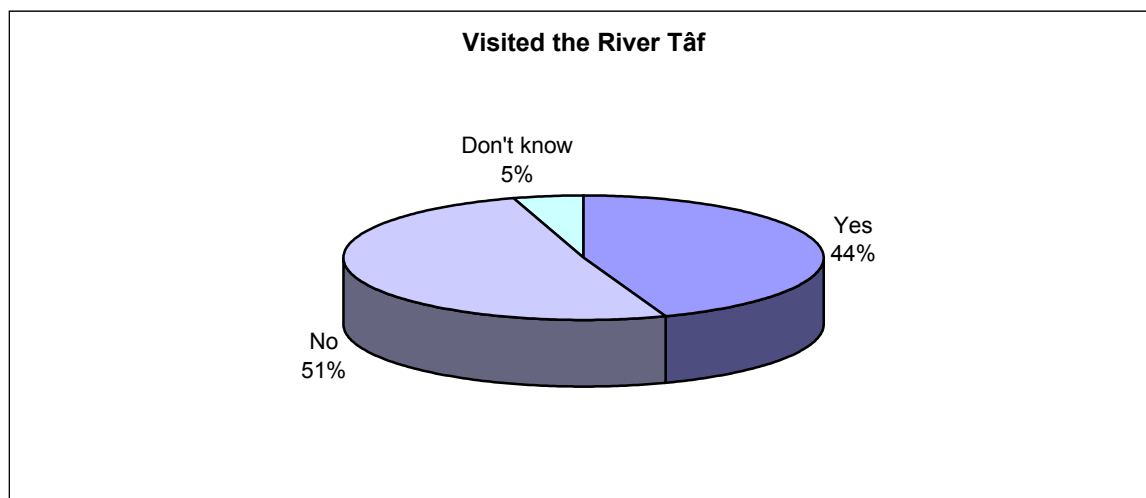
Fig 13 And have you ever visited the River Tywi?



Weighted base: Respondents who have heard of the River Tywi = 228
 Unweighted base: Respondents who have heard of the River Tywi = 232

Just under ½ (47%) of those who were aware of the Tywi, had visited the river. Thus 28% of the total sample had visited the Tywi.

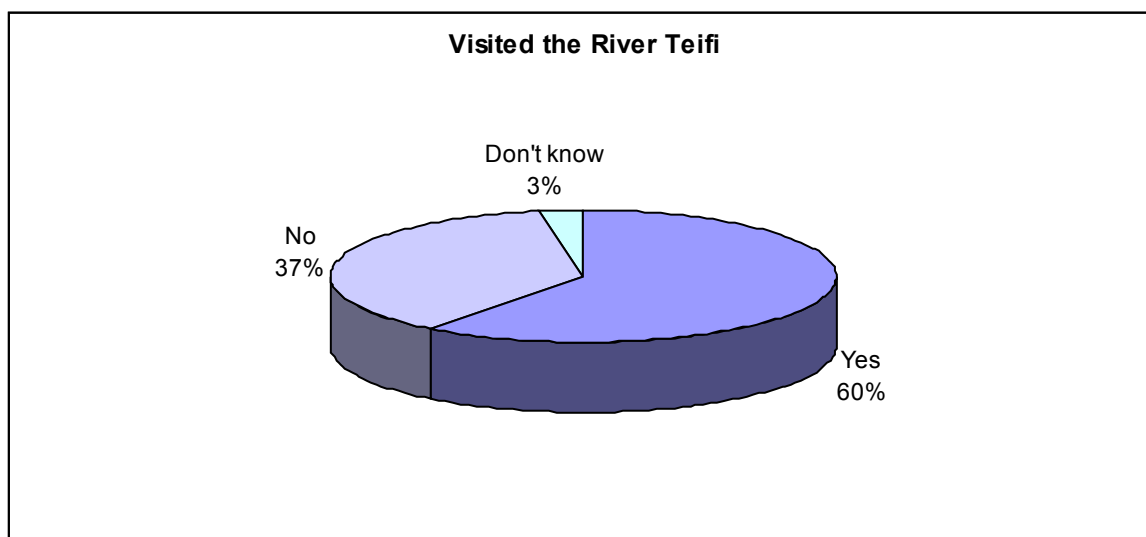
Fig 14: And have you ever visited the River Tâf?



Weighted base: Respondents who have heard of the River Tâf = 217
Unweighted base: Respondents who have heard of the River Tâf = 223

The proportion of those aware of the Tâf who had visited the river (44%), was not dissimilar to the figure recorded for the Tywi. This represents 25% of the total sample.

Fig 15: And have you ever visited the River Teifi?



Weighted base: Respondents who have heard of the River Teifi = 164
Unweighted base: Respondents who have heard of the River Teifi = 168

A high proportion of those who were aware of the Teifi had actually visited this river (60%). Thus 25% of the total sample had visited, which is in line with that for the Tâf and Tywi, despite the lower level of awareness of the Teifi. This could be due to the importance of the Teifi as a sea trout river increasing the proportion of visits in relation to awareness.

Males were considerably more likely than the females to have visited the Teifi (males 70%, females 50%). No other notable differences were recorded by gender, age or social grade when considering the proportions visiting the 3 Welsh rivers.

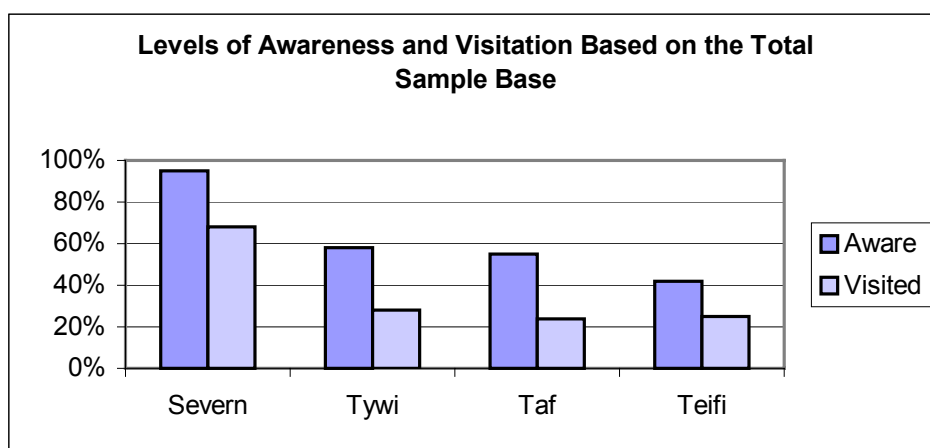
Table 6: Visits to the Welsh rivers by location

Visited Welsh Rivers									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrewsb'y, Tewkesb'y & Newtown	Lampeter	B'ham	N Wales	Chester	Reading & Slough
<i>Total (Weighted)</i>	228	46	27	43	24	10	38	23	17
Visited River Tywi	47%	74%	35%	42%	75%	35%	27%	34%	38%
<i>Total (Weighted)</i>	217	40	24	42	20	17	34	21	19
Visited River Tâf	44%	67%	59%	43%	38%	43%	25%	48%	21%
<i>Total (Weighted)</i>	164	42	20	25	24	10	28	8	8
Visited River Teifi	60%	91%	50%	57%	94%	40%	19%	48%	12%

NB: only the weighted bases have been included in the above table for clarity. Totals only include those aware of each river

The majority of the Carmarthen/Cardigan and Lampeter respondents had visited the Teifi, whilst around ¾ of respondents from these locations had visited the Tywi. Respondents most likely to have visited the Tâf resided in Carmarthen/Cardigan or Lydney/Sharpness. The high figure for Lydney and Sharpness is difficult to explain given their geographic location. Despite the high awareness of the Welsh rivers shown by respondents in North Wales, relatively few had actually visited.

Fig 16: Awareness and visitation levels for the River Severn and Welsh Rivers



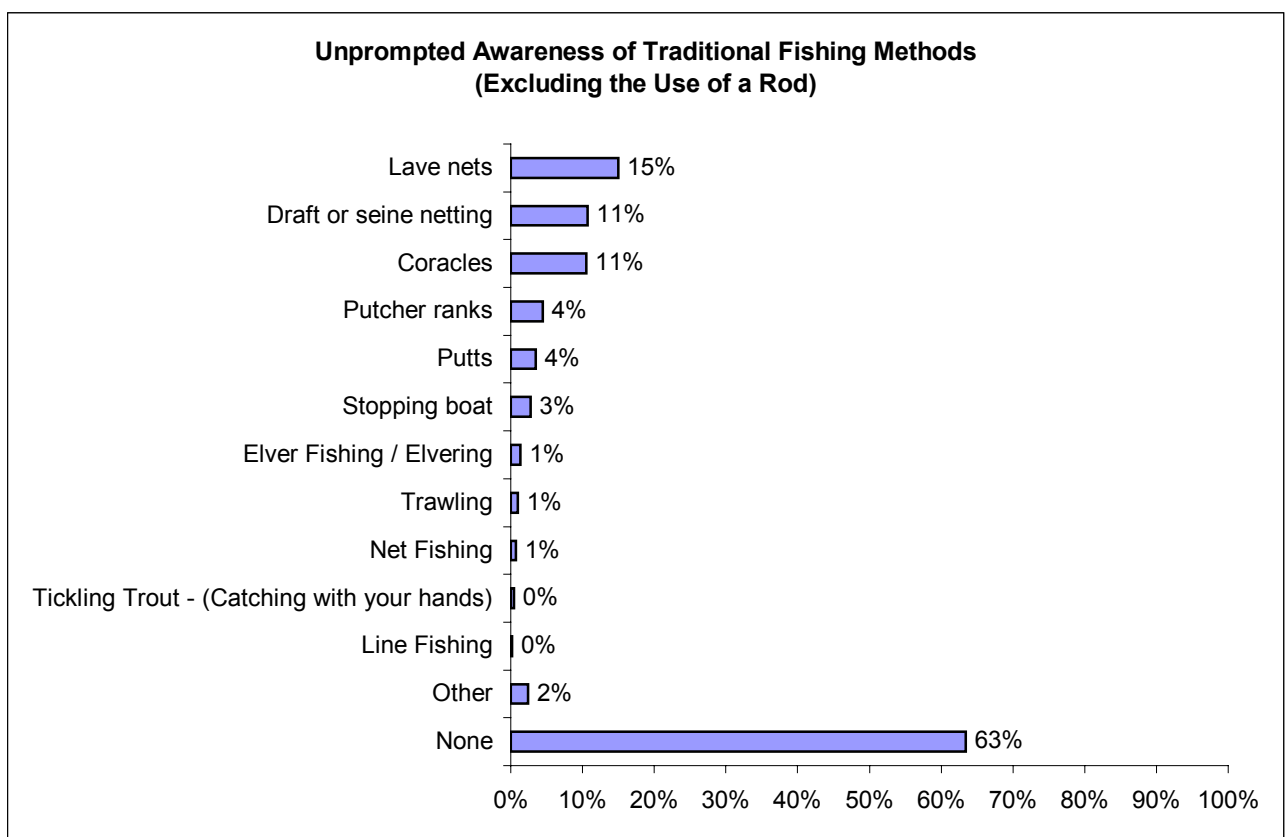
Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

The data contained within the above chart is expressed as a percentage of the total sample, thus enabling direct comparisons between awareness and visits.

The chart demonstrates the high level of awareness of the River Severn and the high proportion of the total sample who had visited. Despite the lower level of awareness of the Teifi, the proportion of the total sample who had visited is similar to that for the other Welsh rivers.

4.3 Awareness of traditional fishing methods

Fig 17: Apart from fishing with a rod, which traditional methods of fishing, if any, have you heard of, which can be used on rivers in the UK? You can tell me a name for a type of fishing or just describe it to me. (Multiple Response)



Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

The majority of respondents could not name any traditional fishing method without prompting. 15% did however mention lave nets, 11% draft or seine netting and 11% coracles. A small number mentioned patcher ranks and putts (4% in each case). Although the majority of respondents could not name a traditional fishing method over 1/3 could do so.

Awareness was generally greater amongst the over 35's.

Perhaps not surprisingly unprompted awareness of coracles was greater amongst respondents who lived close to or in the general area of the Welsh coracle fisheries i.e. Carmarthen/Cardigan 48%, Lampeter 28%. Awareness of lave nets (26%), patcher ranks

(16%) and putts (12%) was greatest amongst the residents of Lydney and Sharpness. (See table 7).

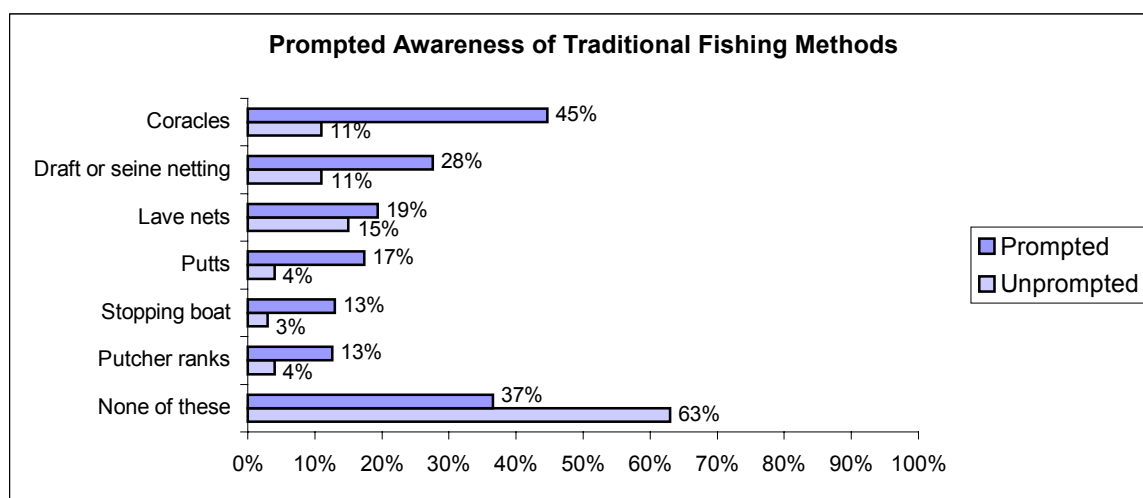
It is perhaps worth noting here that the use of lave nets and coracles have been publicised recently through press articles which may have raised awareness of these methods amongst respondents.

Draft or seine netting are the most common types of salmon netting methods used geographically in England and Wales and on practically all the estuaries within the study which would explain the relatively high unprompted awareness level.

Table 7: Awareness of traditional methods of fishing by location

Q10 Apart from fishing with a rod, which traditional methods of fishing, if any, have you heard of, which can be used on rivers in the UK ?									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrew'y, Tewk'y & Newtown	Lamp'r	B'ham	N Wales	Chester	Read'g & Slough
<i>Unweighted row</i>	392	46	49	76	23	48	47	53	50
<i>Total (Weighted)</i>	392	47	50	76	24	48	46	52	50
Lave nets	15%	15%	26%	9%	18%	13%	12%	17%	14%
Draft or seine netting	11%	26%	6%	5%	25%	8%	15%	7%	5%
Coracles	11%	48%	0%	5%	28%	2%	9%	2%	4%
Putcher ranks	4%	3%	16%	5%	3%	2%	2%	0%	4%
Putts	4%	5%	12%	2%	3%	2%	2%	0%	3%
Stopping boat	3%	0%	3%	3%	3%	0%	4%	2%	7%
None	63%	34%	55%	68%	53%	85%	68%	73%	62%

Fig 18: I will now read out the names and descriptions of some traditional methods of fishing and I would like you to tell me which if any you are aware of. (Multiple Response)



Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

Unprompted data has been included in the above chart to enable comparisons to be made.

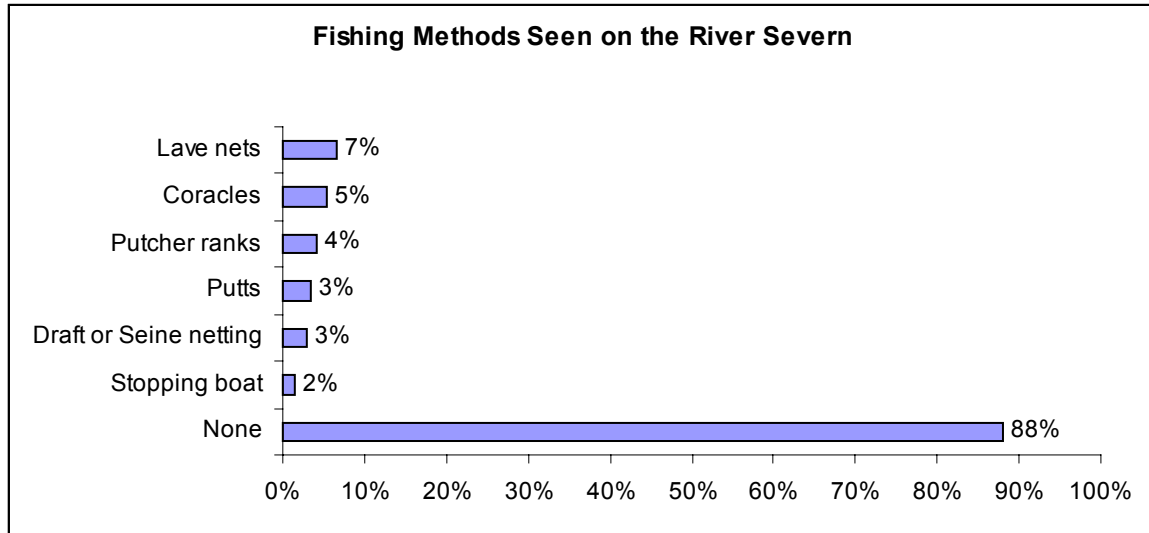
When prompted with a list of traditional fishing methods, 63% of the sample indicated they were aware of at least one of these methods. The greatest level of awareness was shown for coracles, followed by draft or seine netting.

Interestingly awareness of coracles was greatest in Lampeter (59%), Shrewsbury/Tewkesbury/Newtown (55%), Lydney/Sharpness (54%) and also Chester (53%). Prompted awareness in Carmarthen/Cardigan only rose to 30%. (The latter figure does not appear to be in line with data recorded in Camarthen/ Cardigan on awareness of fishing methods seen on the Welsh rivers where a value of 38% was recorded.) The level of awareness of putts and stopping boats increased considerably following prompting. The low unprompted awareness might have been expected as neither of these two fishing methods have operated for a number of years.

Table 8: Prompted awareness of traditional fishing methods by location

Q11 I will now read out the names and descriptions of some traditional methods of fishing and I would like you to tell me which, if any, you are aware of.									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrew'y, Tewk'y & Newtown	Lamp'r	B'ham	N Wales	Chester	Read'g & Slough
<i>Unweighted row</i>	392	46	49	76	23	48	47	53	50
<i>Total (Weighted)</i>	392	47	50	76	24	48	46	52	50
Coracles	45%	30%	54%	55%	59%	26%	34%	53%	47%
Draft or seine netting a boat	28%	41%	34%	30%	20%	12%	9%	37%	32%
Lave nets	19%	31%	26%	20%	23%	8%	11%	18%	20%
Putts	17%	30%	30%	17%	28%	15%	2%	13%	10%
Stopping boat	13%	24%	13%	9%	23%	10%	6%	15%	10%
Putcher ranks	13%	25%	19%	13%	16%	4%	8%	12%	7%
None of these	37%	31%	27%	29%	20%	64%	55%	28%	37%

Fig 19: Have you seen any of these fishing methods on the River Severn? (Multiple Response)

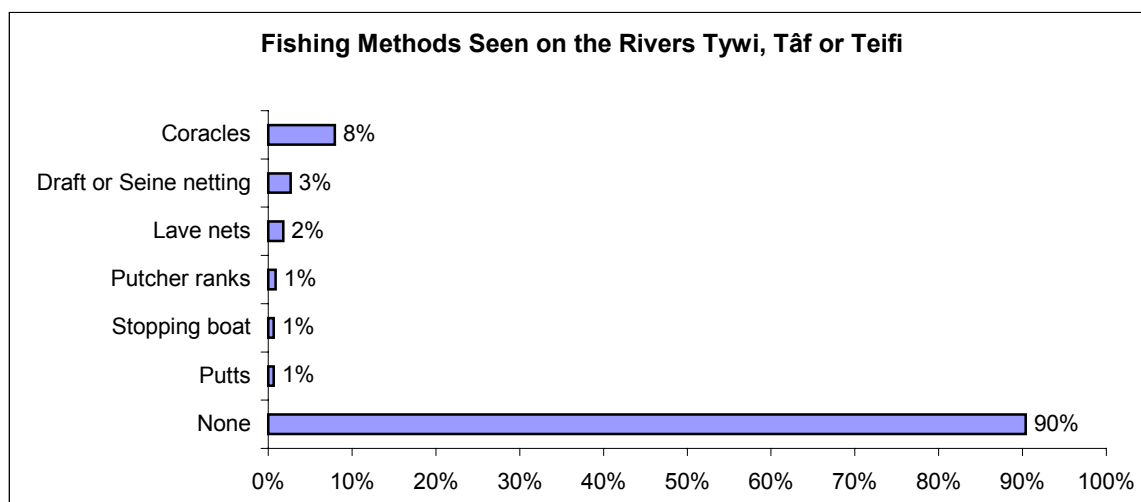


Weighted base: All respondents = 392
Unweighted base: All respondents = 392

Of all those interviewed the vast majority had not seen any of the traditional methods of fishing on the River Severn. 12% did however suggest they had seen one or more methods, with lave nets being the most commonly mentioned. Interestingly 5% believed they had seen coracles on the River Severn, which although might be the case, would not have been for/duo to fishing.

Awareness of fishing methods on the River Severn was considerably higher in Lydney and Sharpness, towns either side of the River Severn fisheries, than elsewhere. (Lydney and Sharpness: lave nets 31%, patcher ranks 21%, putts 21%, draft or seine netting 11%, stopping boat 8%.) There was also a belief amongst Lydney & Sharpness respondents that coracles had been seen on the River Severn (16%), which perhaps suggests some confusion between the types of fishing methods.

Fig 20: Have you seen any of these fishing methods on the Rivers Tywi, Tâf or Teifi? (Multiple Response)



Weighted base: All respondents = 392
 Unweighted base: All respondents = 392

Only 10% of the total sample believed they had seen traditional fishing methods on the Welsh rivers. Coracles were the most likely to have been seen. A number of other methods were mentioned which would not have been used on these rivers (lave nets, patcher ranks, stopping boats and putts). It is clear therefore, that even amongst the few that believed they had seen traditional fishing methods there was a degree of confusion over what they had actually seen.

Awareness of coracles on the Welsh rivers was greatest in Carmarthen/Cardigan (38%) and also Lampeter (38%). Interestingly however the residents of these areas and Cardigan/Carmarthen in particular also demonstrated the greatest perceived awareness of other fishing methods on the Welsh rivers e.g. draft or seine netting 17%, lave nets 8%, patcher ranks 6%, putts 4% and stopping boat 4%.

4.4 Willingness to pay

After completion of the screener questionnaire which collected the information contained in the previous pages of this report, information about the traditional fishing methods on the River Severn estuary and Welsh coracle fisheries was forwarded by post to all respondents willing to take part. The fisheries information can be found in the appendix to this report.

Respondents were asked to read this information and then take part in a follow up interview, which covered the topics in the subsequent pages of this report. The main element of this interview was to understand willingness to pay to maintain the minimum level of traditional fisheries (1 coracle fishery, 1 patcher rank, 14 lave nets and 2 draft nets) on both the River Severn and Welsh coracle fisheries and also willingness to

contribute an additional amount to maintain the current levels (3 coracle fisheries, 28 lave nets, 7 putcher ranks and 5 draft nets).

Prior to eliciting willingness to pay (WTP), respondents were presented with a valuation scenario on which to base their valuation and also the payment vehicle i.e. the way the respondent would be expected to pay for the good.

The valuation scenario was detailed as follows:

Valuation scenario:

These traditional methods of fishing for salmon found on either the River Severn Estuary or the Rivers Tywi, Tâf and Teifi are in danger of being lost as the fisherman cannot earn a living from them.

The traditional fishing methods could however be maintained by providing money via a charitable trust fund to the fishermen to enable them to continue fishing by traditional methods in these rivers.

The trust fund would seek one off payments from the general public, which would be invested to provide an annual income to support these traditional fishermen.

It is important to note that the River Severn fisheries and the Welsh coracle fisheries were covered in this one scenario. It was considered inappropriate to deal with the two fisheries separately within one study, as WTP for the fishery presented within a second scenario is likely to be lower than that for the first thus introducing a bias to the findings. In order to understand any difference in the valuation of the River Severn and Welsh coracle fisheries respondents were asked to allocate points to each fishery, based on how they would like their contribution to be divided between the fisheries.

The payment vehicle selected for use in the survey as detailed above, was a one off payment to a trust fund, which would be invested to provide an annual income to support the traditional fishermen.

A one off payment was selected as this was thought more realistic for the scenario under consideration, and would be less likely to result in grossly exaggerated valuations than monthly contributions.

A trust fund was the preferred option due to any potential hostility toward payment via national or local taxes or direct payments to the Environment Agency.

Both the valuation scenario and payment vehicle were tested amongst a focus group comprising ADAS employees with no knowledge of or link to the project to ensure understanding and acceptance.

Q3-Q6 of the follow up questionnaire were value elicitation questions, designed to draw out respondents willingness to trade goods for money. In order to fulfil the requirements of economic valuations the process elicited the maximum WTP.

A payment ladder was utilised within the study to elicit maximum WTP. Respondents were asked to indicate how certain they would be to contribute each of the amounts on the ladder, until they indicated they were certain not to pay. At this point the elicitation process was ended. For each amount from 50p upward respondents were asked to indicate whether they were certain to, likely to, unlikely to or certain not to pay. This scale was used to further refine the payment ladder and gain a greater understanding of the WTP at each level. The highest value at which respondents indicated they would be certain to bid represented their maximum willingness to pay.

The payment ladder used within the survey is shown below. This ladder and associated questions were designed to elicit the WTP to maintain the minimum level of traditional fisheries. A similar ladder was used to elicit WTP an additional amount to maintain the current level of traditional fishing.

PAYMENT LADDER					
Q4 How certain would you be to make a one- off donation of 50p to the charitable fund to maintain a minimum level? READ OUT CERTAIN TO SCALE FROM BELOW					
And how certain would you be to make a one-off donation of £1					
REPEAT FOR ALL VALUES UNTIL RESPONDENT REPLIES “CERTAIN NOT TO” THEN MOVE ON TO Q5					
Amount	Certain to	Likely to	Unlikely to	Certain not to	Unsure to
50p					
£1					
£2					
£3					
£4					
£5					
£7.5					
£10					
£12.5					
£15					
£20					
£30					
£40					
£50					
£75					
£100					
£150					
£200					
Over £200					

4.5 Mean scores

To enable mean scores to be calculated during the analysis, values were attached to each response on the rating scale e.g. 'certain to' to 'certain not to'.

In each case the highest value in the scale was allocated to the most positive response e.g. 'certain to' and a rating of 1 was allocated to the most negative response e.g. 'certain not to'. The higher the mean score, therefore, the more positive the overall response.

The "unsure" responses were not included in the calculation of mean scores.

4.6 WTP to maintain a minimum level of traditional fishing methods

The following section of the report details the WTP to maintain a **minimum** level of traditional fishing methods on the River Severn and Welsh coracle fisheries.

27% of the total sample indicated they were willing to contribute an amount to maintain the minimum level of traditional fishing on the River Severn estuary and the 3 Welsh rivers.

On further investigation of the data and consideration of the reasons why respondents were willing to pay 11 respondents were removed from the sub sample who indicated they were WTP. The 11 respondents were shown to have given false positive responses to the WTP question. 10 indicated they like to give to a good cause/ get satisfaction from giving, whilst another 1 was interested in protecting all fisheries and not just those under consideration. These responses have been identified as bias responses in papers written on the CV technique (Source: Economic Valuation with Stated Preference Techniques, Summary Guide). It is likely that these respondents would not give as large a donation as suggested as they would spread their money across several causes or would be likely to exaggerate their likely contribution.

The following table indicates the reasons for willingness to pay.

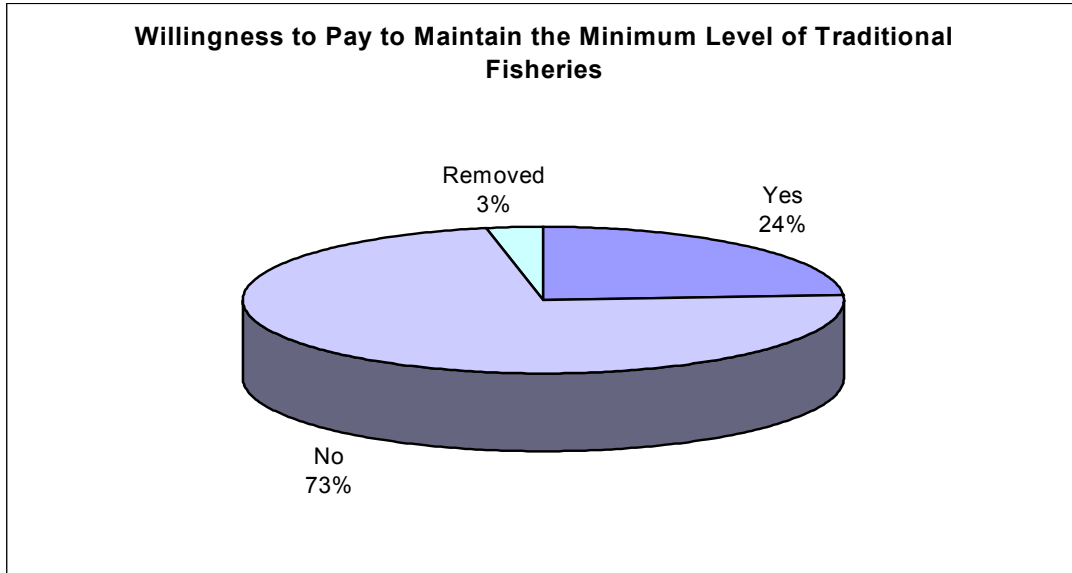
Table 9: Reasons for willingness to pay

Q9 Why are you prepared to contribute money to the charitable fund to maintain the fisheries? (<i>Unprompted, Multiple Response</i>)	
	Those willing to contribute to maintain minimum level
Total	106 (Weighted) 102 (Unweighted)
I would like to stop the fishing methods disappearing	59%
I think this issue / problem is important	35%
We should keep these methods for other people to enjoy	32%
I live / have lived in the area / near the river	14%
I am very interested in fishing	12%
I like to give to a good cause / get satisfaction from giving to a good cause	11%
I am very interested in these fishing methods	8%
I am very interested in this river / rivers	7%
I am English and the Severn is in England	2%
Good for local economy	2%
My answer reflects my views on the need to protect all fisheries / fishing methods and not just these ones	1%
I am Welsh	1%
Fairer method of fishing for the fish	1%
Other	3%

The amounts the respondents removed from the data would be willing to pay proved likely to have an influence on the average consumer surplus and thus strengthened the argument for their removal. (2 were certain to pay £100 and 2 were likely to pay £50, with an average of over £30 for all 11)

The more conservative estimate of the proportion WTP is therefore 24%, as shown in figure 21.

Fig 21: To ensure the minimum levels were maintained would you be willing to contribute any money to a charitable fund, no matter how little or how much?



Weighted base: All respondents = 392
Unweighted base: All respondents = 392

Some differences were noted in terms of willingness to pay across various sample groups. The 16-34yr olds were more likely to be willing to contribute than the 35+age group. There also appeared to be some relationship between distance to the river and willingness to pay however there were a number of anomalies.

There was no significant difference in the proportion of respondents willing to contribute between location categories 1 and 2 (i.e. close to the estuary and away from the estuary but near to the river). A significant difference was highlighted, however between location category 3 (away from the rivers) and category 1. The WTP fell from 37% in category 1 to 18% in category 3.

When calculating potential revenue across the population it will, therefore be important to take into account the variation in WTP by location and nearness to the river and more specifically the river estuary.

Regression analysis was undertaken to explore potential relationships between WTP and distance from the estuary (in terms of the number of miles away from the nearest of the four river estuaries and location category). Only weak relationships were identified (only 2-3% of the location category and distance distribution is explained by the regression line). Relationships between WTP and age and income were even weaker. The detailed outcome of the regression analysis can be found in the appendix to this report.

Although not statistically significant a number of anomalies existed. WTP within Lampeter a category 2 location, in the vicinity of the Welsh rivers was comparable to that for category 3 (away from the rivers). A high proportion of the Lampeter sample did not contribute as they felt the issue was not important or they didn't care about it (67%).

These respondents were however as likely as other subgroups to want to visit the fisheries.

Also data for the Reading and Slough location showed a higher proportion willing to pay than other category 3 locations, although this difference was not significant. Although these respondents were no more likely to want to visit the fisheries than those in other locations, it is possible that their location on the M4 corridor, providing easy access to the Severn and Wales, may have resulted in a greater affinity with the area.

Awareness of the River Severn or Welsh rivers or whether respondents had or had not visited the rivers did not appear to influence the willingness to contribute. This was also the case for whether respondents fished or had someone in the household who fished and also membership of environmental groups.

NB: Bases on the following 2 tables exclude respondents removed due to false positive WTP.

Table 10: WTP by age and location category

Q3. First of all I would like you to consider whether you would be willing to contribute to maintain the MINIMUM level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers; and if so how much you would be willing to contribute. By age and location							
		AGE			LOCATION		
	Total	16-34 yrs	35-54 yrs	55+yrs	CAT 1	CAT 2	CAT 3
<i>Unweighted row</i>	382	92	138	152	93	94	195
<i>Total (Weighted)</i>	381	121	132	127	94	93	193
Yes	25%	32%	23%	21%	37%	26%	18%
No	75%	68%	77%	79	63%	74%	82%

Table 11: WTP by location

Q3. First of all I would like you to consider whether you would be willing to contribute to maintain the MINIMUM level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers; and if so how much you would be willing to contribute. By location									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrew'y, Tewk'y & Newtown	Lamp'r	B'ham	N Wales	Chester	Read'g & Slough
<i>Unweighted row</i>	382	44	49	71	23	48	47	52	48
<i>Total (Weighted)</i>	381	45	50	70	24	48	46	51	48
Yes	25%	38%	37%	30%	15%	16%	19%	15%	24%
No	75%	62%	63%	70%	85%	84%	81%	85%	76%

Table 12: Reasons for unwillingness to pay

Q8 Why would you not be willing to contribute any money to the charitable fund to maintain the fisheries? (<i>Unprompted, Multiple Response</i>)	
	Those not willing to contribute to maintain minimum level
Total	286 (Weighted) 290 (Unweighted)
It's not that important an issue / don't care about it	42%
Can't afford to pay anything	24%
Rather give money to other charities	15%
There are more important things to spend money on	14%
The Government / others should pay	9%
I don't like fishing	8%
Should be left to die out	5%
I need more time to answer	5%
Concern over how the money would be spent	4%
I don't live near enough / near the river	3%
Concerned over fish stocks / conservation	2%
Fishing is cruel / should be banned	2%
Rather pay by a different method	2%
Not a viable project	2%
Don't like charities	1%
Just make a museum / tourist attraction of it	1%
Believe they can make a living from it	1%
They can get another job	0%
These fishermen are also trawling all the river illegally	0%
Spending should be on all fisheries not just this one	0%
Can't afford free range salmon so why pay to fish for it	0%
Would put money in local collection box	0%
I'm Welsh and the Severn is an English river	0%
I don't live in Wales	0%
Other	1%

Table 12 identifies reasons why respondents were not willing to donate. The responses highlighted in red are identified as false negatives i.e. 21% (max); whilst the true negatives amount to 79%. This raises the question about the relevant population over which to aggregate.

A decision needs to be made on how to treat the false negatives. In the aggregation they can either be treated as:

(a) having zero WTP: ie as true negatives or

(b) as having a WTP i.e. behaving as the true positives

False negatives are those who gave a negative response in that they suggested they were unwilling to donate, however their reasons for not donating suggest that they would be WTP something but objected to the payment vehicle, etc. If it is believed that they would have behaved as the true positives, then the proportion of the population WTP will increase. In order to return a conservative estimate for WTP however the potential false negatives have not been added to the willing to pay sample, as the effect on the utility value of the fisheries will be considerable.

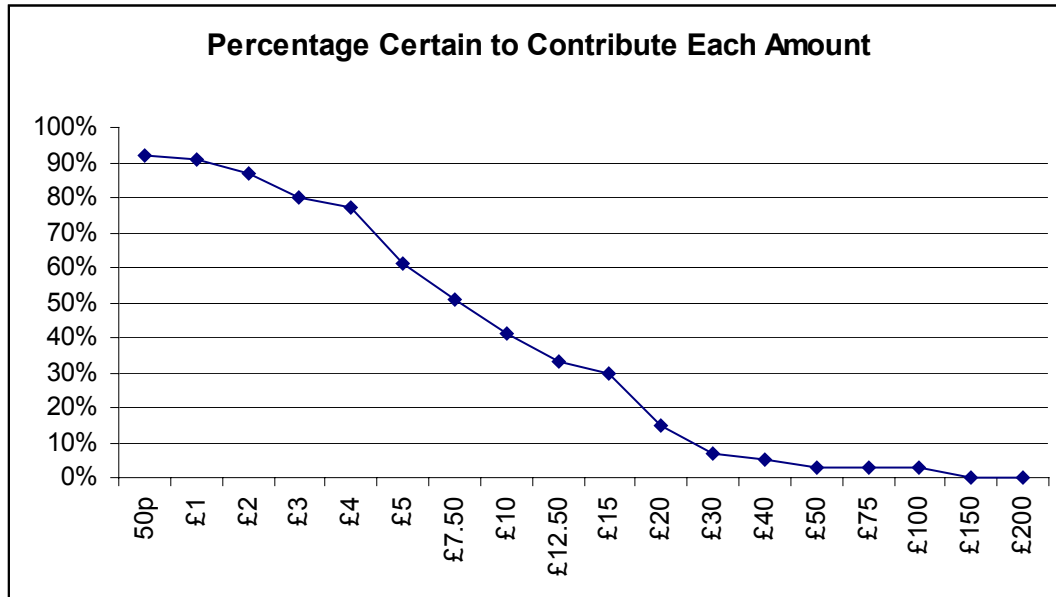
The portion of the sample that indicated they were WTP (24%) were asked to indicate how certain they were to contribute individual amounts from 50p. The following table summarises these responses. As soon as a respondent indicated they were certain not to contribute an amount the process was stopped.

Table 13: Likelihood to donate each amount to maintain a minimum level of fishing methods

Q4. How certain would you be to make a one-off donation of x to the charitable fund to maintain a minimum level ?							
	<i>Weighted Base</i>	Certain to (4)	Likely to (3)	Unlikely to (2)	Certain not to (1)	Unsure	Mean score
50p	95	92%	3%	0%	3%	2%	3.9
£1	92	93%	2%	1%	3%	1%	3.9
£2	90	92%	4%	0%	3%	1%	3.9
£3	87	87%	6%	1%	5%	1%	3.8
£4	83	88%	6%	1%	3%	1%	3.8
£5	79	73%	17%	2%	7%	1%	3.6
£7.50	74	65%	6%	5%	21%	3%	3.2
£10	58	67%	19%	8%	2%	4%	3.6
£12.50	57	54%	8%	9%	26%	2%	2.9
£15	42	67%	9%	2%	20%	2%	3.3
£20	33	42%	45%	3%	8%	3%	3.2
£30	31	21%	19%	3%	55%	3%	2.1
£40	14	37%	9%	0%	47%	6%	2.4
£50	7	36%	53%	0%	0%	11%	3.4
£75	7	36%	0%	0%	53%	11%	2.2
£100	3	76%	0%	0%	0%	24%	4.0
£150	3	0%	76%	0%	0%	24%	3.0
£200	3	0%	37%	0%	38%	24%	2.0
Over £200	2	0%	61%	0%	0%	39%	3.0

The following figure charts the proportion of the sample certain to pay each amount. Percentages have been calculated on the total number within the sample willing to pay to maintain the minimum level of traditional fishing methods.

Figure 22: Respondents certain to contribute each amount (as a one-off donation)



Base: Respondents who were certain to contribute to maintain the minimum level of traditional fishing methods, weighted base = 95, unweighted base = 92

Thus 92% of those willing to pay were certain to pay 50p, whilst none were willing to pay £150 or more.

The *maximum* amounts, varying proportions of the sample were willing to pay are shown in the following table.

Table 14: Maximum WTP to maintain a minimum level

Maximum WTP - highest value respondents were certain to contribute	
	Total
Unweighted row	92
Total	95
£100	3%
£50	0%
£40	3%
£30	1%
£20	8%
£15	15%
£12.50	3%
£10	8%
£7.50	9%
£5	11%
£4	16%
£3	3%
£2	7%
£1	4%
50p	1%
Mean	£12.40
Standard deviation	17.57
Standard error	1.92

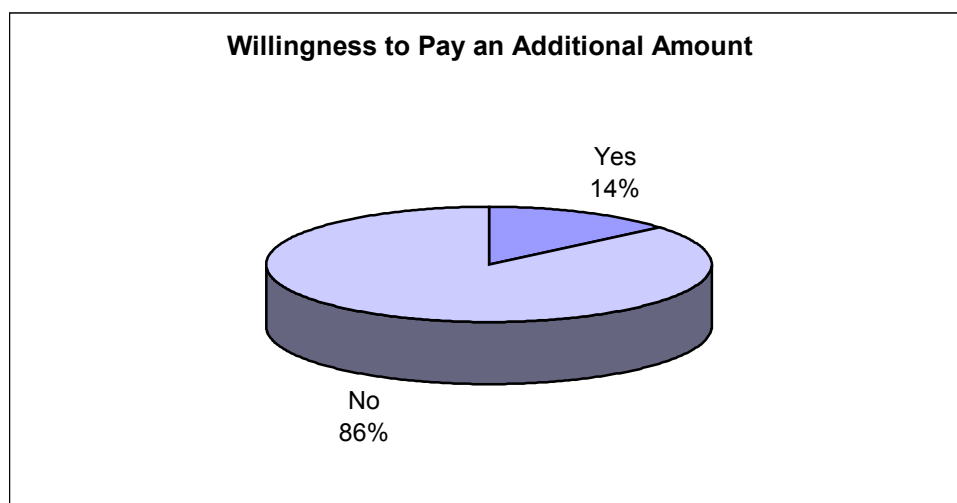
The above table only includes those 24% of respondents who were willing to pay something to maintain the minimum level of fishing methods on the rivers. There was a wide variation in the maximum respondents were willing to contribute. The average contribution willing to be made was £12.40 (SD 17.57, SE 1.92, median 7.5 and mode 4.00.) Please note this would be a one-off contribution to a trust fund.

This average contribution did not vary significantly by gender, age or location, however base sizes for the latter sub groups were small.

4.7 Willingness to pay an additional amount

The following chart highlights the proportion of respondents who were willing to donate an additional amount to maintain the traditional fishing methods at their current level.

Fig 23: In addition to the money you would donate to maintain a minimum level on the River Severn and the 3 Welsh rivers, would you be willing to donate an extra amount to the charitable fund to maintain the current level of traditional fishing?



Weighted base: Respondents who would contribute to maintain minimum level = 95

Unweighted base: Respondents who would contribute to maintain minimum level = 92

14% of those respondents who were willing to contribute to maintain a minimum level of traditional fishing methods (excluding the false positives), were willing to donate an additional amount to maintain the current level of traditional fishing on the River Severn and Welsh coracle fisheries.

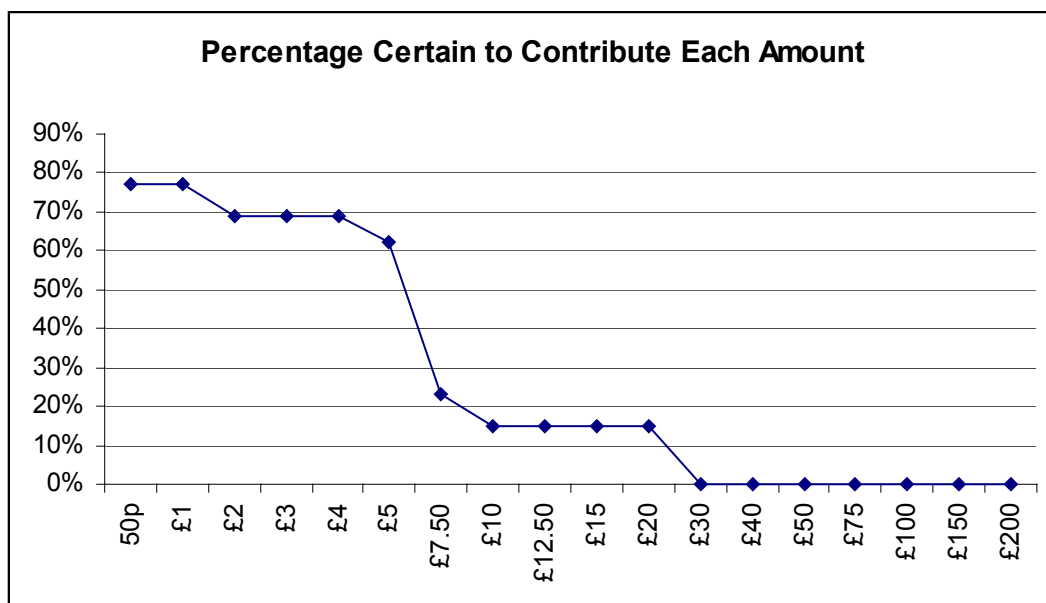
This represents 3% of the total sample.

Table 15: Likelihood to contribute each additional amount

Q6. How certain would you be to make an additional one-off donation of x to the charitable fund?							
	Weighted Base	Certain to (4)	Likely to (3)	Unlikely To (2)	Certain not to (1)	Unsure	Mean score
50p	13	77%	10%	0%	6%	7%	3.7
£1	12	82%	0%	0%	18%	0%	3.4
£2	10	92%	8%	0%	0%	0%	3.9
£3	10	92%	0%	8%	0%	0%	3.8
£4	10	92%	0%	0%	8%	0%	3.8
£5	9	90%	10%	0%	0%	0%	3.9
£7.50	9	37%	0%	0%	63%	0%	2.1
£10	3	62%	0%	0%	38%	0%	2.9
£12.50	2	100%	0%	0%	0%	0%	4.0
£15	2	100%	0%	0%	0%	0%	4.0
£20	2	100%	0%	0%	0%	0%	4.0
£30	2	0%	100%	0%	0%	0%	3.0
£40	2	0%	0%	0%	100%	0%	1.0

The previous table demonstrates the likelihood of respondents contributing each additional amount. The amounts respondents were willing to contribute ranged from 50p to £40. 77% of those willing to contribute an additional amount were certain to pay 50p. None were certain to contribute £30 or more. The following graph shows the proportion certain to pay each amount.

Figure 24: Respondents certain to contribute each additional amount



Base: Those willing to contribute an additional amount to maintain the current level of traditional fishing methods, weighted base = 13, unweighted base = 13

Table 16: Maximum additional amount

Maximum WTP - highest value respondents were certain to contribute	
	Total
Unweighted row	13
Total	13
£20	16%
£7.50	10%
£5	37%
£4	7%
£1	6%
Mean	£8.10
Standard deviation	6.68
Standard error	2.11

The above table only includes respondents who were willing to donate an additional amount, and shows the maximum amounts they were willing to pay. Thus 6% were only willing to pay an additional £1, whilst 16% were willing to pay an additional £20.

The average additional amount the respondents were willing to contribute was £8.10 (SD 6.68, SE 2.11, median 5 and mode 5)

4.8 Allocation between the fisheries

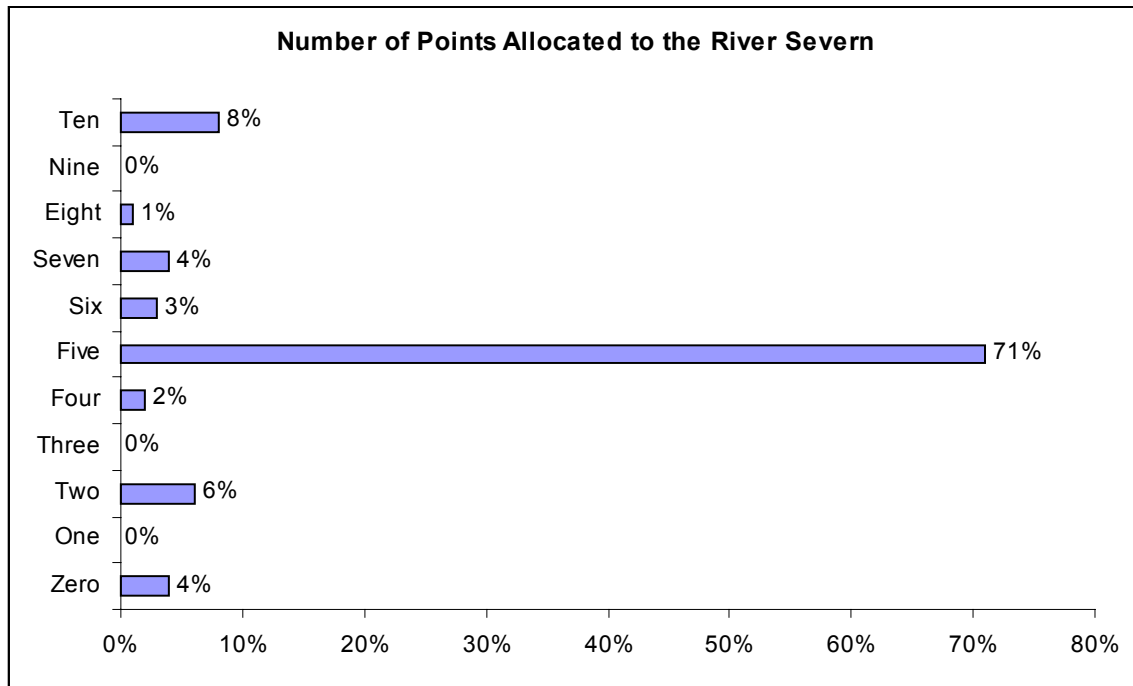
It has been established that 24% of the sample were willing to donate to maintain the minimum level of traditional fishing methods, whilst 3% were willing to donate an amount in addition to this to maintain the current level. The average WTP for the minimum level is £12.40, whilst the average for the additional amount is £8.10

These are the respective consumer surplus amounts for the minimum level, and additional utility for the current level of traditional fishing, for the relevant sub-sets of respondents. It is the utility that these respondents derive from knowing that traditional fishing methods are used on the Severn and three Welsh rivers. It represents the benefit that they currently derive, but for which they currently do not have to pay, and it is the amount that they would be willing to pay rather than see traditional fishing disappear on these rivers.

Given that the survey sought to elicit WTP for the River Severn and the Welsh coracle fisheries, it is important to understand how respondents would like to see their contribution split between the fisheries.

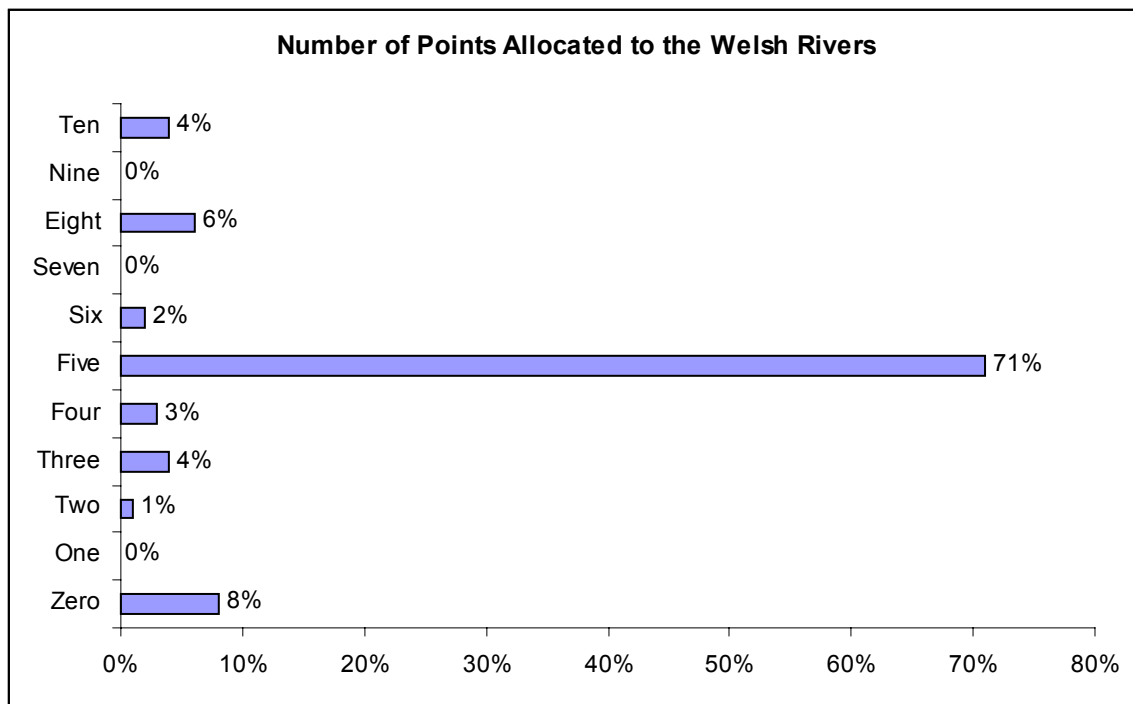
Respondents were asked to allocate points out of ten to the River Severn estuary and the Welsh coracle fisheries according to how they wished their donation to be allocated. The following graphs demonstrate the allocation of points between the fisheries.

Fig 25: Number of Points Allocated to the River Severn



Weighted base: Respondents who would contribute to maintain the minimum level = 95
 Unweighted base: Respondents who would contribute to maintain the minimum level = 92
 Median = 5, Mode = 5, Mean Score = 5.1, SE = 0.21 (mean score 0 to +10)

Fig 26: Number of Points Allocated to the Welsh Rivers



Weighted base: Respondents who would contribute to maintain the minimum level = 95
 Unweighted base: Respondents who would contribute to maintain the minimum level = 92
 Median = 5, Mode = 5, Mean Score = 4.9, SE = 0.21 (mean score 0 to +10)

The majority of respondents allocated equal points to the Welsh rivers and the River Severn, suggesting they valued them equally. The average score for the River Severn was 5.1, compared to an average of 4.9 for the Welsh rivers. There was no significant difference between the two means.

These similar scores have been recorded despite the sample having a bias toward the River Severn, in that 42% of those willing to pay lived on or near to the Severn, and only 22% of those WTP lived on or near the Welsh rivers.

If the average contribution overall to the River Severn and Welsh coracle fisheries is £12.40, for the purpose of calculating the value attached to each of the fisheries, approximately 50% of the donation can be attributed to the Severn and 50% to the Welsh fisheries.

Although base sizes are very low there did appear to be differences in the allocation of points between the Welsh rivers and River Severn by location and distance from the rivers. There was a greater points allocation by residents of Lydney and Sharpness and Shrewsbury/Tewkesbury and Newtown for the River Severn, than by residents of Carmarthen/Cardigan and Lampeter. The reverse situation was true when considering points allocation for the Welsh rivers. More points were allocated to the Welsh rivers than the River Severn by residents of Carmarthen/Cardigan than by residents of Lydney and Sharpness.

Table 17: Points allocation by location

Mean points allocation to the R Severn and Welsh rivers									
	Total	Carm'then & Cardigan	Lydney & Sharpness	Shrew'y, Tewk'y & Newtown	Lamp'r	B'ham	N Wales	Chester	Read'g & Slough
<i>Unweighted base</i>	92	16	18	21	3	7	9	8	10
<i>Total (Weighted)</i>	95	17	18	21	3	8	9	7	11
River Severn	5.1	3.4	6.6	5.6	3.8	5.1	4.7	5.0	5.2
Welsh rivers	4.9	6.6	3.4	4.4	6.2	4.9	5.3	5.0	4.8

Table 18: Reasons for allocating more points to the Welsh coracle fisheries

Q10 Why did you allocate more money to the fisheries on the 3 Welsh rivers than on the River Severn? (Unprompted, Multiple Response)	
	If 6 or more points allocated to the Welsh rivers, amongst those willing to contribute to maintain minimum level
<i>Total</i>	12 (Weighted) 12 (Unweighted)
I live near the rivers	53%
I live in Wales	33%
Wales needs greater financial investment generally	16%
I know more about these rivers / have heard of them	15%
I'm Welsh	12%
Like Wales / the Welsh	8%

Table 19: Reasons for allocating more points to the River Severn

Q11 Why did you allocate more money to the fisheries on the River Severn estuary than on the Welsh rivers? (Unprompted, Multiple Response)	
	If 6 or more points allocated to the River Severn Estuary, amongst those willing to contribute to maintain minimum level
<i>Total</i>	16 (Weighted) 16 (Unweighted)
I live near the river / in the area	68%
There are more fishing methods on the Severn to maintain	19%
I know more about this river / have heard of it	18%
I'm English	6%
Some of the methods have already gone out of operation	5%

Unsurprisingly several of the reasons given as to why respondents allocated more points to one river than another related to the fact they lived near to the river or knew about it.

4.9 Donation maximising revenue price

Maintaining culturally traditional fishing methods in the River Severn Estuary and the Rivers Tywi, Tâf and Teifi is a 'public good'.³ Public goods are often supported through taxation and public subsidies and grants; or through charities and charitable donations.

If a charitable foundation is considered as a mechanism for funding a public good, an important issue in fund raising is the donation that charity managers should suggest to donors as a charitable contribution, assuming that they wish to maximise revenue to the charity.

Some 24% of households said that they would be WTP something towards maintaining a minimum level of traditional fishing on these rivers. Any charitable foundation would need to target this group of households in its fund raising.

The maximum financial revenue charitable contribution price, for traditional cultural fishing methods along the Severn and Welsh rivers, can be determined from the demand curve of these households WTP to maintain these traditional fishing activities. The maximum revenue price is the point on the demand curve at which revenue (price * number of households willing to pay that price) is maximised. The conditions for determining the maximum revenue point on a demand curve for a good are:

first-order condition: $f'(P) = 0$, $dq/dp = 0$

second-order condition: $f''(P) < 0$, $d^2q/dp^2 < 0$

where q = quantity or number of households willing to pay, and p = contribution per household.

³ A 'public good' is a good that is non-rival in consumption (i.e. there is zero opportunity cost of consumption), and non-excludable (everyone might benefit from the good, even those who choose not pay for it). Hence, normal market prices cannot be applied to public goods.

The demand curve, relating households' willing to pay, was derived from the survey, recording the WTP amount (P), the number of households accepting that WTP amount (Q). The analysis is based upon the aggregate demand curve. The functional relationship between visits and price represented by the demand curve was of the form:
 $Q = b_0 e^{-b_1 P}$

The exact parameters for this curve were estimated by fitting a non-linear regression model to the function $Q = b_0 / (\exp(b_1 * P))$, which searches for a best fit over possible ranges of parameters of the model, with respect to the specified derivatives of the function specified in the model. The procedure first examines the starting value specifications in the parameters; and evaluates the residual sum of squares for each combination of values specified in the grid of values. A Marquardt iterative method was used to regress the residuals onto the partial derivatives of the model with respect to the parameters until the iterations converged.

The parameters producing the best fit function to maintain a minimum level of culturally traditional fishing methods were $b_0 = 95.0412$ (standard error = 1.8125), and $b_1 = 0.0866$ (se = 0.00384); with confidence intervals for b_1 of 0.0784 and 0.0948 at 95% level (see Table 20). The non-linear least squares model was an extremely good fit, with the model sum of squares being 42067 and residual sum of squares being only 122.

Table 20: Maximising revenue donation estimates

	Coefficient	95% confidence	Limits	Maximum revenue price
Minimum level	0.0866	0.0784	0.0948	£11.55
Addition for current level	0.1068	0.0791	0.1345	£9.36

The optimal single donation amount that achieves maximum revenue can be derived from this model. The optimal donation amount is where $dq/dp = -1$. i.e. where the elasticity of demand with respect to price is -1 . For those households willing to pay to maintain a minimum level of culturally traditional fishing methods on the Severn, Tywi, Tâf and Teifi, this point and the maximum revenue point, is achieved when $P = £11.55p$ per household. This is statistically the 'best estimate' but it is subject to statistical error. But there is a 95% chance that the maximum revenue donation will lie within a fairly narrow band between £10.55 and £12.75 per household.

Fewer households were agreeable to paying more to maintain the current traditional fishing level on these rivers. Only 3% of households said that they would be WTP to maintain the current level of traditional fishing methods along the rivers. The donation revenue maximising amount that these households would be willing to pay, in additional to the amount they would be willing to donate for a minimum level of traditional fishing, was £9.36 (see Table 20). Again the model is an extremely good fit with the model sum of squares being 709.4 and residual sum of squares being only 15.64. However, the 95% confidence limits are slightly wider proportionately than in the minimum level model. There is a 95% chance that the maximum additional donation will lie between £7.43 and £12.64 per household.

4.10 Benefits to the population of England and Wales

Utility estimates based on consumer surplus estimates

Geographical boundary:

An outer boundary has been set to the geographical area within which it would be reasonable to expect donations to be made in order to avoid gross over estimates of the heritage value of the River Severn and Welsh coracle fisheries.

Calculations of the heritage value have been based on households within the following Environment Agency regions and areas :- Midlands region, EA Wales, Thames West and North Wessex.

Since distance from the rivers has an impact on WTP, the aggregation will be based on this variable, however given that there was no significant difference in the proportion of the sample WTP between category 1 and 2 and also the difficulty in identifying category 1 and category 2 locations additional to those included within the survey, an average WTP for both category 1 and 2 will be used.

Category 1 and 2 locations are identified as any postcode district through which the main stems of the Rivers Severn, Teifi, Tywi or Tâf run, together with postcode districts directly adjacent to the river.

Category 3 locations are classed as those that are away from the rivers and will thus include all postcode districts within the specified Environment Agency regions and areas that are not classed as category 1 or 2.

The map at figure 1 identifies the postcode areas that have been included within the calculations.

4.11 Estimated heritage value

The average consumer surplus was £12.40.

Given the low level of willingness to pay an additional amount the heritage value will be calculated on WTP a minimum amount.

As an average, 32% of category 1 and 2 respondents and 18% of category 3 respondents would be willing to donate a one off amount to maintain the minimum level of fisheries on the River Severn and Welsh coracle fisheries.

It is assumed that only one donation would be made per household. It was therefore important to identify the number of households that fell into categories 1 and 2 and also category 3 within the specified areas.

Population data for each postcode within the selected Environment Agency regions was identified by the Environment Agency. This information is contained within the appendix to this report. ONS census data shows that the average number of people per household

Table 22: Heritage value of the River Severn fisheries within the Midlands, North Wessex and Thames West areas

Category	Population	No. Households (Population /2.31 people per household)	No. households x % Households WTP (Cat 1 and 2 32% Cat 3 18%)	Estimated heritage value of the Welsh coracle and River Severn fisheries within Midlands/North Wessex/Thames West i.e. No. households WTP x average consumer surplus (£12.40)	Estimated heritage value of the River Severn fisheries (50%* of total value for R. Severn and Welsh coracles)
Cat 1 and 2	652k	282k	90k	£1.1m	£0.5m
Cat 3	10.5m	4.5m	810k	£10m	£5m
Total	11.2m	4.8m	864k	£10.7m	£5.3m

* 50% of the total value has been allocated to the R. Severn fisheries, given that the majority of respondents valued the R. Severn and Welsh coracle fisheries equally. Refer to figures 25 and 26.

Table 23: Heritage value of the Welsh coracle fisheries within EA Wales

Category	Population	No. Households (Population /2.31 people per household)	No. households x % Households WTP (Cat 1 and 2 32% Cat 3 18%)	Estimated heritage value of the Welsh coracle and River Severn fisheries within EA Wales i.e. No. households WTP x average consumer surplus (£12.40)	Estimated heritage value of the Welsh coracle fisheries (50%* of total value for R. Severn and Welsh coracles)
Cat 1 and 2	45k	19k	6k	£75k	£38k
Cat 3	3m	1.3m	234k	£2.9m	£1.5m
Total	3m	1.3m	234k	£2.9m	£1.5m

* 50% of the total value has been allocated to the Welsh coracle fisheries, given that the majority of respondents valued the R. Severn and Welsh coracle fisheries equally. Refer to figures 25 and 26.

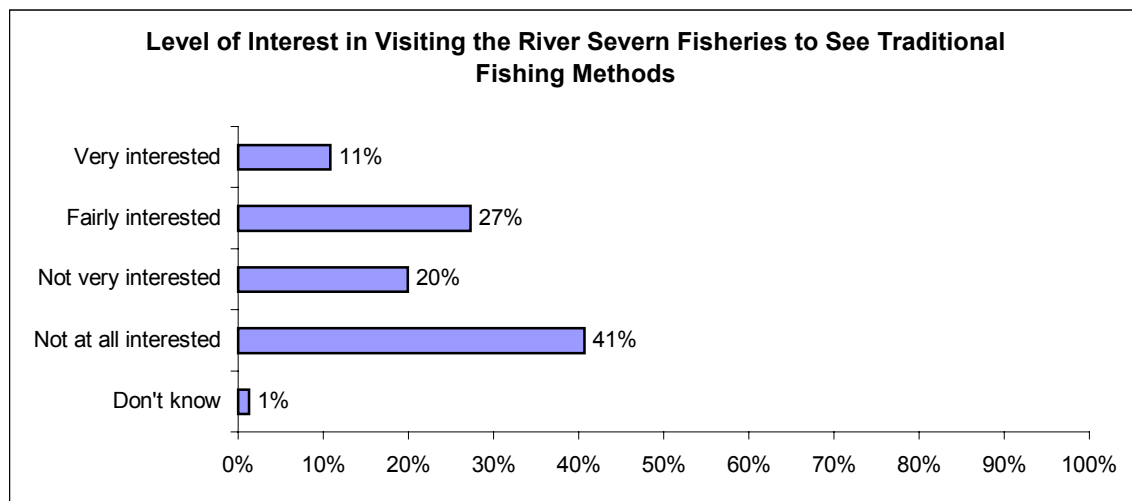
Thus in summary the heritage value for the River Severn and Welsh coracle fisheries within EA Wales, Midlands, North Wessex and Thames West is £13.6m.

The value for the Welsh coracles in EA Wales is £1.5m and the value for the River Severn fisheries in the Midlands, North Wessex and Thames West is £5.3m.

4.12 Interest in visiting the fisheries

All respondents were asked to indicate their level of interest in visiting the fisheries to see the traditional methods of fishing, irrespective of whether they were willing to pay to maintain them.

Figure 27: How interested would you be in visiting the River Severn fisheries to see the traditional methods of fishing?



Weighted base: All respondents = 392
Unweighted base: All respondents = 392
Mean Score = 2.08, SE = 0.05 (mean score +1 to +4)

On the whole there was a reasonable level of interest in visiting the River Severn to see the traditional fishing methods (38%). There was however a substantial proportion of the sample who were not interested at all (41%).

Interest did not appear to vary by demographics, however there were notable differences in the level of interest by location. Respondents who lived in the category 3 locations away from the river showed the least interest in visiting. The greatest interest was shown by those who lived in the locations closest to the river, particularly Sharpness and Lydney on the banks of the River Severn.

Table 24: Interest in visiting the River Severn fisheries by location

Q12. How interested would you be in visiting the River Severn fisheries to see the traditional methods of fishing ?									
		Location							
	Total	CAT 1	CAT 2	CAT 3	Carm'n & Card'n	Lydney & Sharp's	Shrew'y, Tewke'y & Newtown	Lampeter	
<i>Unweighted row</i>	392	95	99	198	46	49	76	23	
<i>Total</i>	392	97	100	196	47	50	76	24	
Very interested	11%	13%	12%	9%	14%	13%	10%	17%	
Fairly interested	27%	32%	32%	23%	25%	39%	32%	32%	
Not very interested	20%	27%	17%	18%	29%	25%	17%	16%	
Not at all interested	41%	24%	39%	50%	30%	19%	41%	32%	
Don't know	1%	3%	1%	0%	3%	4%	0%	3%	
Mean score	2.08	2.36	2.17	1.91	2.24	2.48	2.12	2.35	
		**		**		**			
SD	1.06	1.01	1.08	1.04	1.05	0.96	1.07	1.14	
SE	0.05	0.11	0.11	0.07	0.16	0.14	0.12	0.24	

** significant difference compared to the sample mean

There was also a relationship between interest in visiting the Severn to see the traditional methods and willingness to pay to maintain the minimum level. Those who were willing to pay were significantly more likely (at the 99% level) to be interested in visiting than those who were not. 59% of those who were willing to pay were interested in visiting compared to 31% of those who were not willing to pay.

Table 25: Interest in visiting the River Severn fisheries by WTP

Interest in visiting by willingness to contribute to maintain the minimum fishing methods (Q3)			
	Total	Yes	No
<i>Unweighted row</i>	382	92	290
<i>Total</i>	381	95	286
Very interested	10%	20%	7%
Fairly interested	28%	39%	24%
Not very interested	20%	21%	20%
Not at all interested	41%	17%	49%
Don't know	1%	2%	1%
Mean score	2.1	2.6	1.9
		**	**
SD	1.05	1.00	0.99
SE	0.05	0.10	0.06

** significant difference compared to the sample mean

(The above table excludes false positives, and thus the total base is lower than the overall sample base)

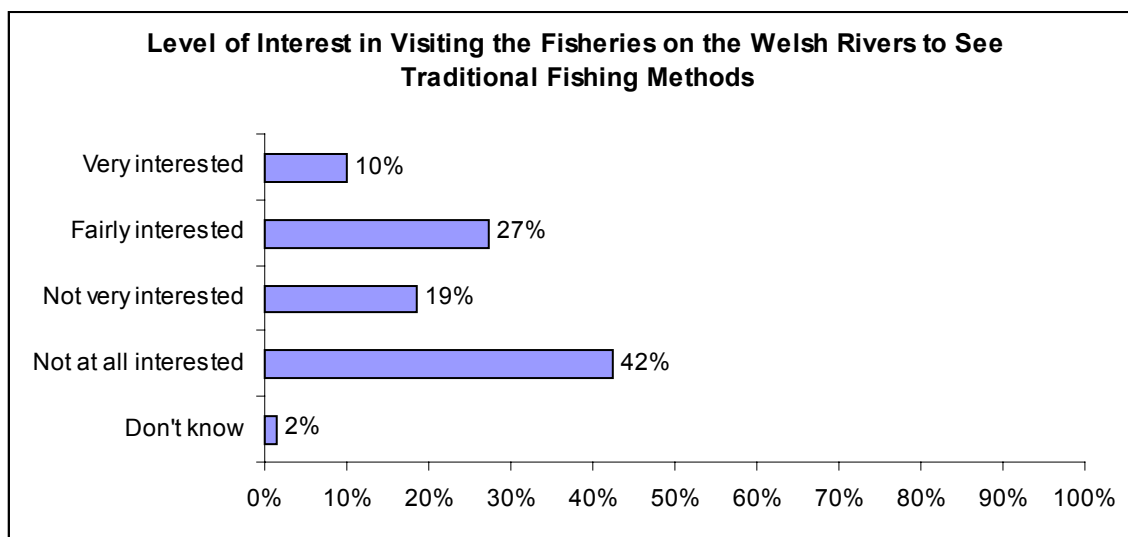
There was also a clear difference in response between those who had previously visited the River Severn and those who had not. The respondents who had previously visited

the River Severn (mean score 2.21) showed significantly greater interest than those who had not (mean score 1.82) at the 99% level.

Respondents who had not heard of or seen any traditional fishing methods on the River Severn were on the whole less likely to be interested in visiting those who had heard of or seen these methods. (Not heard of mean score 1.91, compared to heard of coracles 2.64, putts 2.68, putcher ranks 2.64. Not seen any traditional methods on the River Severn mean score 2.02, seen coracles on the Severn 2.47, seen putts on the Severn 2.63.)

Respondents who fished or had someone in the household who fished were also more likely to be interested in visiting (53%) than those who did not (34%). Members of an environmental group (mean score 2.6) were more interested than those who were non members (mean score 2.2). (Significant difference at the 99% level.)

Fig 28: How interested would you be in visiting the fisheries on the Tywi, Tâf or Teifi to see the traditional methods of fishing?



Weighted base: All respondents = 392
Unweighted base: All respondents = 392
Mean Score = 2.05, SE = 0.05 (mean score +1 to +4)

Interest in visiting the Welsh rivers to see the traditional fishing levels (37%) was similar to that for the River Severn. Again a substantial proportion of respondents were not interested at all (42%).

Interest was again influenced by location, the greatest interest being shown by respondents in category 1, and particularly those who lived near the Welsh rivers in Cardigan/Carmarthen and also Lampeter. Category 3 respondents showed the least interest.

Table 26: Interest in visiting the Welsh coracle fisheries by location

Interest in visiting by location								
	Location							
	Total	CAT 1	CAT 2	CAT 3	Carm'n & Card'n	Lydney & Sharp's	Shrew'y, Tewke'y & Newtown	Lampeter
<i>Unweighted row</i>	392	95	99	198	46	49	76	23
<i>Total</i>	392	97	100	196	47	50	76	24
Very interested	10%	17%	12%	6%	24%	10%	11%	17%
Fairly interested	27%	29%	31%	25%	27%	30%	30%	36%
Not very interested	19%	26%	14%	17%	22%	29%	15%	12%
Not at all interested	42%	26%	41%	51%	24%	27%	44%	32%
Don't know	2%	3%	1%	1%	3%	4%	0%	3%
Mean score	2.05	2.38	2.14	1.85	2.52	2.24	2.07	2.39
		**		**	**			
SD	1.06	1.06	1.10	0.99	1.12	0.98	1.09	1.14
SE	0.05	0.11	0.11	0.07	0.17	0.14	0.12	0.24

** significant difference compared to the sample mean at the 99% level

Interest was also significantly greater (at the 99% level) amongst those who were willing to contribute to the trust fund to maintain the minimum level of traditional fishing methods than amongst those who were unwilling to pay (willing to pay mean score 2.5, unwilling to pay 1.9).

Table 27: Interest in visiting the Welsh coracle fisheries by WTP

Interest in visiting by willingness to contribute to maintain the minimum fishing methods (Q3)			
	Total	Yes	No
<i>Unweighted row</i>	382	92	290
<i>Total</i>	381	95	286
Very interested	9%	16%	6%
Fairly interested	28%	41%	24%
Not very interested	19%	21%	18%
Not at all interested	43%	20%	51%
Don't know	1%	2%	1%
Mean score	2.0	2.5	1.9
		**	**
SD	1.04	0.99	1.00
SE	0.05	0.10	0.06

** significant difference compared to the sample mean at the 99% level

(The above table excludes false positives, and thus the total base is lower than the overall sample base)

Those respondents who had heard of or visited the Welsh rivers were the most interested in visiting to see the traditional fishing methods. (E.g. Heard of the Tywi mean score 2.22, not heard of 1.80, visited the Tywi 2.48, not visited 1.99).

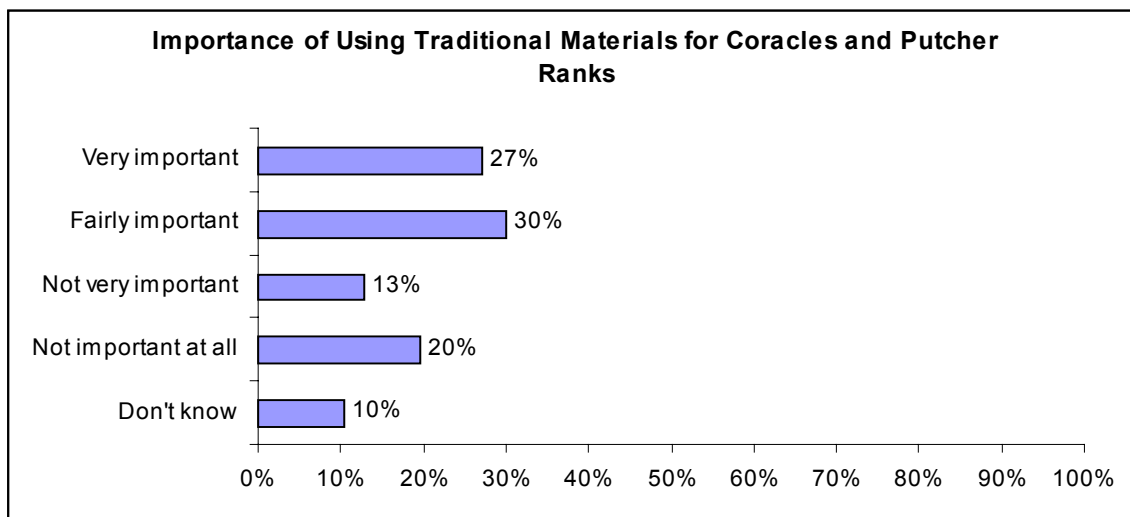
The ABC1's (2.20) were more interested in visiting the Welsh rivers than the C2DE's (1.89).

Respondents who had heard of a traditional fishing method were again more likely to be interested in visiting than those who had not (Not aware prompted mean score 1.88). Respondents who had actually seen coracles on the rivers appeared the most interested in visiting (2.47).

Again members of environmental groups (mean score 2.5) and those who fished or had people in the household who fished were more interested in visiting (52% interested) than their counterparts.

4.13 Importance of using traditional materials

Fig 29: How important do you feel it is to continue to use the traditional materials for the coracles and putcher ranks?



Weighted base: All respondents = 392, unweighted base: All respondents = 392
Mean Score = 2.72, SE = 0.06 (mean score +1 to +4)

On the whole respondents believed it was fairly important that traditional methods were used to maintain the coracles and putcher ranks.

Category 3 respondents were the least likely to believe using the traditional materials was important, particularly those from Birmingham and Chester.

Table 28: Importance of using traditional materials by location

Importance of using traditional materials by location												
	Location											
	Total	CAT 1	CAT 2	CAT 3	Carm'n & Card'n	Lydney & Sharp's	Shrew'y, Tewke'y & Newt'n	Lamp'r	B'ham	N Wales	Chester	Read'g Slough
<i>Unweighted Row</i>	392	95	99	198	46	49	76	23	48	47	53	50
<i>Total</i>	392	97	100	196	47	50	76	24	48	46	52	50
Very important	27%	32%	36%	20%	39%	25%	35%	40%	11%	28%	18%	25%
Fairly important	30%	36%	25%	30%	27%	44%	25%	23%	33%	35%	25%	26%
Not v imp't	13%	9%	13%	15%	9%	9%	12%	16%	18%	10%	20%	10%
Not im't at all	20%	15%	13%	25%	17%	13%	15%	4%	26%	16%	26%	32%
Don't know	10%	8%	13%	10%	7%	8%	12%	17%	12%	10%	11%	8%
Mean score	2.72	2.92	2.97	2.50	2.96	2.88	2.90	3.20	2.33	2.85	2.39	2.47
			*	**					*		*	
SD	1.12	1.05	1.08	1.13	1.13	0.98	1.12	0.94	1.04	1.07	1.12	1.23
SE	0.06	0.11	0.12	0.08	0.17	0.15	0.14	0.21	0.16	0.16	0.16	0.18

* Significant difference from the sample mean at the 95% level

** Significant difference from the sample mean at the 99% level

Once again those who were willing to contribute to the trust fund were more likely than those who did not, to feel it was important to use traditional materials.

Table 29: Importance of using traditional materials by WTP

Importance of traditional materials by willingness to contribute to maintain minimum fishing methods (Q3)			
	Total	Yes	No
<i>Unweighted row</i>	382	92	290
<i>Total</i>	381	95	286
Very important	27%	32%	25%
Fairly important	30%	33%	30%
Not very important	13%	13%	13%
Not important at all	19%	10%	22%
Don't know	10%	11%	10%
Mean score	2.7	3.0	2.6
		*	*
SD	1.11	1.00	1.13
SE	0.06	0.11	0.07

* Significant difference from the sample mean at the 95% level

(The above table excludes false positives, and thus the total base is lower than the overall sample base)

There were some indications that respondents with greater awareness of the rivers and methods of fishing were more likely to believe traditional methods should be used. Membership of environment groups or likelihood to be involved in fishing *did not* have a significant influence on the perceived importance of using traditional materials. Interestingly although the latter subgroups showed greater interest in seeing the fisheries, they did not place more importance on the use of traditional materials than the remainder of the sample.

5 Conclusions

5.1 Study method

The survey method utilised within the study together with the contingent valuation technique have proved to be successful in enabling an estimate of the heritage value of net fisheries to be calculated. A number of suggestions are however made to improve the method further.

In subsequent studies the geographical area within which the heritage value is to be calculated needs to be considered carefully and ideally decided upon prior to sample planning to ensure the correct selection of sampling points. Larger sample sizes would have improved the reliability of data for each sampling point within this study, and if budget allows larger sample sizes would be recommended for subsequent projects. In order to investigate in more detail and calculate more accurately the influence of distance on WTP, recording the postcode of each respondent and using this within a regression analysis is worthy of consideration for a larger scale survey. Respondents who decline to take part in the follow up element of the study, due to lack of interest in the subject matter, will inevitably influence the proportion of the sample who are willing to pay. Although it may not be possible to rid the study of this bias it is important to be aware of the potential scale of this problem.

5.2 Study findings

24% of the total sample within this study were WTP to maintain the minimum level of traditional fishing methods on the River Severn and Welsh coracle fisheries. The proportion WTP actually varied according to proximity to the river. Although samples sizes were not large enough to identify differences at specific distances away from the estuary or river, it was possible to identify a difference in WTP amongst people who resided in postcodes through which the rivers ran or which lay adjacent to the river and people who lived in postcode areas away from the river.

No clear differences in WTP were evident between postcode areas around the fisheries and further upstream. It is possible that larger sample sizes may have shown more significant differences.

18% of households in sampling locations away from the river and between 26% and 37% of households near to the river were WTP to maintain the minimum level of traditional fisheries. The average one-off donation households were willing to make was £12.40.

Taking into account the WTP to maintain a minimum level of traditional fishing methods and also the number of households within the category 1, 2 and 3 areas, the estimated value placed on the Welsh coracle fisheries by households within Environment Agency Wales is £1.5m. The estimated value placed on the River Severn estuary fisheries by households within the Environment Agency Midlands region, Thames West area and North Wessex is £5.3m.

Only 3% of the total sample were willing to pay an additional amount to maintain the current level of traditional fishing methods on the River Severn and Welsh coracle fisheries. The mean additional amount these households were willing to pay was £8.10. This low level of willingness to pay an additional amount suggests that the preservation of the fishing methods on the rivers is the issue and not the level at which they are operating.

It should be noted that no attempt was made in this study to evaluate the level of participation needed within the fisheries to guarantee that future generations would have the skills to maintain and participate in the fisheries.

There is a reasonable level of interest in visiting the fisheries under consideration, to see the traditional fishing methods, particularly amongst people who live near to the fisheries and have an interest in fishing or the environment. There is thus an opportunity to maximise the value associated with the fisheries, by enabling locals and day visitors particularly, to see demonstrations and examples of the traditional methods both on the rivers and in visitor centres. The use of traditional materials is likely to add to the authenticity and level of interest. There is also potential for a local educational role through schools for example, given the high level of local interest in the fishing methods. Higher interest amongst anglers and members of environmental groups offers opportunities for promoting the fisheries through the rod licence database and via other conservation and environment related organisations.

It must be remembered that this study did not look at the tourism value associated with the fisheries. Finally, it must also be noted that this study measured the awareness of the rivers and the fishing methods at one moment in time and this awareness can be increased by active publicity or marketing. It is possible that active marketing may have influenced awareness of the lave nets on the River Severn. Active marketing would not necessarily however, influence the WTP or heritage value.

Appendix 1: screener questionnaire

Environment Agency – fisheries contingent valuation screener

READ OUT

Good afternoon/ evening, my name is _____. I am calling from Hill Taylor and am carrying out a market research survey on behalf of the Environment Agency.

The aim of the survey is to understand how much people value different fisheries on rivers across the country. You do not have to have an interest in fishing as we need a good mix of people.

The study will help the Environment Agency in their decision making for the future and they would therefore very much appreciate your help.

The information provided will not be linked to your name and you will not receive any contact from another company as a direct result of taking part in this study.

I would like to ask you a few questions now and then send you some information about the fisheries and give you a call again in a couple of days to ask a few more questions. Would you be willing to help me with the survey?

Yes - continue

No - close

As I have to find a good cross section of people to help with the survey I just need to ask you a few questions about yourself.

INTERVIEWER RECORD GENDER OF RESPONDENT

Q1 Gender

Male	1	RECRUIT TO QUOTA
Female	2	

Q2 Which of these age groups do you fall into?

READ OUT	RECRUIT TO QUOTA
Under 16yrs	DO NOT RECRUIT
16 - 24yrs	1
25 - 34yrs	2
35 - 44yrs	3
45 - 54yrs	4
55 - 64 yrs	5
65 and over	6

Q3 Socio Economic Group: Occupation of head of Household

ASK THESE QUESTIONS OF THE HEAD OF HOUSEHOLD

Qualifications _____

Business/industry _____

No of people responsible for _____

State vs Private pension (if applicable) _____

Social Grade

AB	1	
C1	2	
C2	3	
D	4	RECRUIT TO QUOTA
E	5	

Q4 And which of these ranges best fits your household income

READ OUT

Up to £15,000 per year	1
Between £16,000 and £30,000 per year	2
Between £31,000 and £60,000 per year	3
Over £60,000 per year	4
Don't know	5
Refused	6

Q5 Do you work full or part time?

READ OUT

Full time (30+ hours per week)	1
Part time (8-29 hours per week)	2
Unemployed	3
Retired	4
In education	5

Q6 Have you heard of the River Severn?

Yes	1 - Continue
No	2 - Go to Q8
Don't know	3 - Go to Q8

Q7 Have you ever visited the River Severn between Gloucester and the M4 bridge near Bristol?

Yes	1
No	2
Don't know	3

Q8 And have you ever heard of these Welsh rivers?

READ OUT RIVERS ONE AT A TIME

	River Towy	River Tarv	River Teivi
Yes	1	1	1
No	2	2	2
Don't know	3	3	3

Q9 And have you ever visited any of these rivers?

READ OUT RIVERS, ONE AT A TIME THAT RESPONDENT WAS AWARE OF AT Q8

	River Towy	River Tarv	River Teivi
Yes	1	1	1
No	2	2	2
Don't know	3	3	3

Q10 Apart from fishing with a rod, which traditional methods of fishing, if any, have you heard of, which can be used on rivers in the UK? You can tell me a name for a type of fishing or just describe it to me.

DO NOT PROMPT

- Lave nets – a large Y shaped net used by one person, who wades into the water with the net 1
- Putcher ranks – Several hundred cone shaped baskets mounted on a frame. The fish swim into the basket and are caught 2
- Putts – very large cone shaped baskets, about 2m wide and 4m long. The fish are caught when they swim into the baskets 3
- Coracles - small oval shape traditional boats, made of wood and covered in hide. Fishing is carried out by a net strung between two coracle boats across the river. 4
- Stopping boat – strong shallow boats about 7m long and 2.5m wide. Fishing is carried out by a large net on poles in the shape of a V over the side of the boat 5
- Draft or seine netting - large nets spread out from the shore to a little way downstream by a boat 6
- Other (enter description, phrase or word) 7
- None 8

Q11 I will now read out the names and descriptions of some traditional methods of fishing and I would like you to tell me which if any you are aware of.

READ OUT LIST – ROTATE ORDER

- Lave nets – a large Y shaped net used by one person, who wades into the water with the net 1
- Putcher ranks – Several hundred cone shaped baskets mounted on a frame. The fish swim into the basket and are caught 2
- Putts – very large cone shaped baskets, about 2m wide and 4m long. The fish are caught when they swim into the baskets 3
- Coracles - small oval shape traditional boats, made of wood and covered in hide. Fishing is carried out by a net strung between two of the boats across the river. 4
- Stopping boat – strong shallow boats about 7m long and 2.5m wide. Fishing is carried out by a large net on poles in the shape of a V over the side of the boat 5
- Draft or seine netting - large nets spread out from the shore to a little way downstream by a boat 6

None of these

7

Q12 Have you seen any of these fishing methods on the River Severn?

READ OUT REFER TO DESCRIPTIONS AT Q11 AS REQUIRED

Lave nets	1
Putcher ranks	2
Putts	3
Coracles	4
Stopping boat	5
Draft or Seine netting	6
None	7

Q13 Have you seen any of these fishing methods on the Rivers Towy, Tarv or Teivi

READ OUT REFER TO DESCRIPTIONS AT Q11 AS REQUIRED

Lave nets	1
Putcher ranks	2
Putts	3
Coracles	4
Stopping boat	5
Draft or Seine netting	6
None	7

Q14 Do you or anyone in your household go fishing nowadays?

IF YES PROBE TO CLARIFY

Yes regularly	1
Yes occasionally	2
No	3 – Go to Q16

Q15 What type of fish have you/they fished for?

READ OUT

Salmon	1
Sea trout	2
Brown or rainbow trout	3
Coarse fish	4
Eels	5
Sea fish/sea angling	6
Other	7

Q16 Are you a member of any environment or conservation related organisation?

IF YES PROBE TO CLARIFY

Yes (angling related)	1
Yes (general – RSPB, Friends of the Earth etc.)	2
No	3
Don't know	4

That's all the questions I need to ask now.

So I can send some information out to you I need to take your name and address.

RECORD NAME AND ADDRESS

House no. or name

Street name

Town

County

Postcode

RECORD TEL NUMBER

When will be the best time to call you back to finish the survey?

Arrange a call back time.

INTERVIEWER RECORD LOCATION ACCORDING TO POSTCODE

Category 1

Camarthan	SA31	1
Cardigan	SA43	2
Lydney	GL15	3
Sharpness	GL13	4

Category 2

Shrewsbury	SY1, SY2, SY3	5
Tewkesbury	GL20	6
Newtown	SY16	7
Lampeter	SA48	8

Category 3

Birmingham	B	9
North Wales	LL	10
Chester	CH	11
Reading & Slough	RG and SL	12

Appendix 2: fisheries information

Salmon fishing methods on the River Severn Estuary and Rivers Teifi, Tywi and Tâf

River Severn Estuary

The River Severn Estuary is situated off the west coast of Great Britain, between the cities of Gloucester and Bristol.

An estuary is the mouth of a river, where it enters the sea.

Rivers Teifi, Tywi and Tâf

The Teifi, Tywi and Tâf are located in South West Wales.

Fishing methods

The following pages describe different types of fishing methods that have been used either on the River Severn Estuary or the three Welsh rivers.

Fishing methods on the River Severn Estuary

Putcher ranks



The majority of the salmon caught on the River Severn are taken in Patcher ranks.

Putchers are tapering basketwork traps in the shape of a cone and less than 1.5 metres in length. Traditionally putchers were made from willow and hazel but other materials including bamboo, mild steel, plastic coated steel and stainless steel, are now used.

Typically several hundred are mounted horizontally on a framework of stout poles to form a 'rank'. Patcher ranks are situated between high and low water.

Most ranks have the open ends of the putchers facing upstream, i.e. into the ebb tide and catch fish that are dropping back downstream. Occasionally the putchers are set with the open ends downstream to catch fish moving upstream, 'flood fishing'. In either case salmon enter the baskets with the tide and are unable to back out. As the tide ebbs the baskets are exposed and the fish can be removed.

Specific sites only can now be used for these putcher ranks. These 37 historic locations were identified under the 1865 Salmon Fishery Act.

In 2003 only 7 of the 37 historic sites were still operating. This type of fishing is unique to the Severn Estuary.

Putts



A putt was a much larger trap than a putcher (described above). It consisted of three separate sections - the kype, butt and forewheel. Traditionally, like the putcher, these were made from woven willow and hazel. The kype (outer end) may measure about 2 metres in diameter with the trap being about 4 metres in length.

Putts are positioned with the mouth upstream to fish the ebb tide. Salmon, eels, dabs, flounders and other small fish and shrimp are all caught in putt because of the close weave of the basketwork in the forewheel. It is permissible for putts to be modified to prevent salmon entering so they can fish outside of the salmon season.

Like putcher ranks their use and number are restricted to those identified under the 1865 Salmon Fishery Act.

No putts are currently operated in the Severn Estuary.

This type of fishing is unique to the Severn Estuary

Stopping boat



Twenty-four stop net boats were authorised by the Special Commissioners in 1865.

Stopping boats were stout boats about 7 metres in length and 2.5 metres wide with a shallow draft. They were moored across the tide on an anchored wire, usually attached to the shore.

Like putchers they normally fished the ebb tide using a large net on poles lashed in the shape of a V and projecting over the side of the boat. The net was counter balanced by weights on the ends of the poles and supported by a prop. A number of cords, attached to the bag of the net were held taut by the fisherman so he could feel when a fish hit the net. As soon as a strike was felt the prop was knocked away allowing the weights on the poles to lift the head line on the net, trapping the fish in the bag. The net could then be pulled to the surface and the fish removed by unfastening the drawstrings.

Stop boats were only used on the River Severn and the adjacent River Wye.

The last stop boat ceased fishing in the 1980's

Lave nets



The lave net is used by one man and mounted on a Y shaped frame, capable of being folded when not in use. Lave nets are used on the ebb tide and at low water.

There are two basic methods of fishing with a lave net. The fisherman who has waded into the river, may look for the wake of a salmon which has turned back from shallow water where the river channel flows over a sandbar. Alternatively the fisherman may use the net to 'cower' or hold the net below water against the current to catch fish which are dropping downstream with the tide.

The opportunity for fishing is seriously limited by the size of the tide and windy conditions, particularly in the upper estuary. Lave netting in the lower estuary below Lydney can be successful in any conditions.

Lave netting is not restricted in the estuary so as many people who wish to apply for a licence may fish.

Up to 400 have fished in the past, currently there are 28 lave netsmen.

Lave netting is unique to the Severn Estuary, although a similar technique is used on the Solway Firth in Cumbria

Draft nets (seine nets)



Draft nets are encircling nets made of long sheets of netting up to 185m in length mounted with floats on the top rope and leads on the bottom rope.

They are laid out from the shore, then using a boat, are taken downstream a little way and the net is then hauled ashore.

Draft netting is only permitted at certain sites between Elmore and Slimbridge.

The Salmon and Freshwater Fisheries Act 1975 controls the use of these instruments.

Most salmon drafts can in theory be fished at all states of the tide, but are generally only fished in the most favourable conditions.

Draft nets are worked in such a method that fish moving upstream will be caught.

Ideal conditions for netting in the lower estuary are a small spring tide and with a southerly wind. As a result a draft net may only be worked for about 5 days in a tidal fortnight with the remaining days being unsuitable.

There are currently 5 draft net stations operating in the River Severn.

Draft netting is a technique that is used in several other estuaries of England and Wales.

Fishing methods on the Rivers Teifi, Tywi and Tâf

Coracle



A coracle is a traditional boat from Wales and the Borders.

It is made from a wooden frame with a hide tightly drawn across it. It has a generally oval appearance and is light and can be easily carried to the water.

There are now three coracle salmon fisheries still operating in Wales on the rivers Teifi, Tywi and Tâf all in South West Wales.

This type of fishing was much more widespread in the past.

Fishing is carried out at night with a length of net being strung between two coracles. The coracles are then paddled downstream at about the speed of flow. Any fish encountered either turns away from the net or swims into the out mesh and becomes entangled between this mesh and the smaller second wall of mesh. The coracle fishermen will feel this struggle and one end of the net will be dropped while the other retrieves the net and fish before removing it.

Appendix 3: follow-up questionnaire

Environment Agency – fisheries contingent valuation follow up questionnaire

SECTION A - INTRODUCTION

Good morning/afternoon/evening. My name is from Hill Taylor. Could I please speak to ASK TO SPEAK TO NAMED RESPONDENT WITH WHOM SCREENER WAS CONDUCTED

TO NAMED RESPONDENT:

REPEAT NAME AND COMPANY AS NECESSARY

I am calling to complete the fisheries survey with you. Is it convenient to do this now?

YES – CONDUCT INTERVIEW

NO – MAKE AN APPOINTMENT TO CALL BACK

Q1 Did you receive the information we sent to you about the fisheries?

Yes - Continue

No – Arrange to re-send information

Q2 And have you been able to read through it all?

Yes - Continue

No – Arrange to call back when they have read it

READ OUT

You will have read about the different traditional salmon fishing methods such as the Coracles, Patcher Ranks, Putts, Stopping boats, Lave nets and Draft nets.

These traditional methods of fishing for salmon found on either the River Severn Estuary or the Rivers Towy, Tarv and Teivi are in danger of being lost as the fisherman cannot earn a living from them.

The traditional fishing methods could however be maintained by providing money via a charitable trust fund to the fishermen to enable them to continue fishing by traditional methods in these rivers.

The trust fund would seek one off payments from the general public, which would be invested to provide an annual income to support these traditional fishermen.

SECTION B – WILLINGNESS TO PAY

Q3 First of all I would like you to consider whether you would be willing to contribute to maintain the minimum level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers; and if so, how much you would be willing to contribute.

By minimum level I mean 1 Coracle fishery, 1 Patcher rank, 14 Lave nets, and 2 Draft nets.

Let me assure you that I am not asking you to make any financial commitment today and that your name and the information you provide will not be passed on to anyone and will be treated confidentially.

To ensure the minimum levels were maintained would you be willing to contribute any money to a charitable fund, no matter how little or how much?

Yes 1 – **Continue**
No 2 – **Go TO Section C**

In a moment I will read out different amounts of money from 50p to over £200. I need to find out how willing you would be to donate each amount as a one off contribution to the charitable trust fund to maintain the minimum level for the fishing methods. I will ask you whether you are certain to, likely to, unlikely to or certain not to pay each of the amounts. You can tell me you are unsure if this is the case. Please do not say you are certain or likely to pay if you can not afford it or if you feel there are more important things for you to spend your money on.

Please just take a moment to yourself to consider how much you would be willing to contribute. (**Give respondent a few seconds then continue**)

**Q4 How certain would you be to make a one- off donation of 50p to the charitable fund to maintain a minimum level?
READ OUT CERTAIN TO SCALE FROM BELOW**

And how certain would you be to make a one-off donation of £1

REPEAT FOR ALL VALUES UNTIL RESPONDENT REPLIES "CERTAIN NOT TO" THEN MOVE ON TO Q5

Amount	Certain to	Likely to	Unlikely to	Certain not to	Unsure
50p					
£1					
£2					
£3					
£4					
£5					
£7.5					
£10					
£12.5					
£15					
£20					
£30					
£40					
£50					
£75					
£100					
£150					
£200					
Over £200					

If respondents replies "over £200" ASK
And what is the maximum you would be willing to pay?

Q5 In addition to the money you would donate to maintain a minimum level on the River Severn and the 3 Welsh rivers, would you be willing to donate an extra amount to the charitable fund to maintain the current level of traditional fishing. That is 3 coracle fisheries, 28 Lave nets, 7 Putter ranks, and 5 Draft nets.

Remember this money would be additional to what you have already agreed to pay to maintain a minimum level of traditional fishing on these rivers.

- Yes – **Continue**
- No – **Go to Q7**

Q6 How certain would you be to make an additional donation of 50p to the charitable fund?

READ OUT CERTAIN TO SCALE FROM BELOW

And how certain would you be to make an additional donation of £1

REPEAT FOR ALL VALUES UNTIL RESPONDENT REPLIES "CERTAIN NOT TO" THEN MOVE ON TO Q7

Amount	Certain to	Likely to	Unlikely to	Certain not to	Unsure
50p					
£1					
£2					
£3					
£4					
£5					
£7.5					
£10					
£12.5					
£15					
£20					
£30					
£40					
£50					
£75					
£100					
£150					
£200					
Over £200					

If respondents replies "over £200" ASK
And what is the maximum you would be willing to pay?

Q7 You say that you would be willing to make a contribution to the charitable fund to help maintain the fisheries. I would now like you to consider how you would allocate this money between the Welsh rivers i.e. the Towy, Tarv and Teivi, and the River Severn Estuary.

You have 10 points to allocate between the Welsh rivers and the River Severn Estuary. The 10 points are equal to the contribution you are willing to make to the charitable fund.

Based on how you would like to see your contribution split between the Welsh rivers and the River Severn estuary, how many points would you allocate to each.

Just to make it clear you need only allocate one number of points to all 3 Welsh rivers combined. You do not need to split your allocation between the Welsh rivers.

First of all how many points would you allocate to

READ OUT RIVER SEVERN AND WELSH RIVERS ONE AT A TIME – ROTATE ORDER

River Severn _____

Welsh rivers (Towy, Tarv and Teivi)_____

TOTAL NUMBER OF POINTS MUST ADD UP TO 10

IF RESPONDENT IS UNSURE HOW TO ANSWER REPEAT INSTRUCTIONS AS NECESSARY

NOW GO TO SECTION C

SECTION C – REASONS FOR WILLINGNESS/NON-WILLINGNESS TO PAY

ONLY ASK Q8 IF RESPONDENT WAS NOT WILLING TO CONTRIBUTE ANY MONEY AT Q3

Q8 Why would you not be willing to contribute any money to the charitable fund to maintain the fisheries?

DO NOT PROMPT

Rather pay by a different method	1
It's not that important an issue/don't care about it	2
Cannot afford to pay anything	3
I do not live near enough/near the river	4
I don't live in Wales	5
I am not Welsh	6
I do not like Wales/the Welsh	7
I am Welsh and the Sever is an English river	8
There are more important things to spend money on	9
The Government/others should pay	10
Concern over how the money would be spent	11
Rather give money to other charities	12
Complaint about trust funds	13
Spending should be on all fisheries not just this one	14
I don't like fishing	15
Fishing is cruel/should be banned	16
I dislike/distrust the Environment Agency	17
I need more time to answer	18
I am a vegetarian/ don't believe in eating animals	19
Other (write in)	20

NOW GO TO SECTION E

ONLY ASK IF WILLING TO CONTRIBUTE MONEY AT Q3

Q9 Why are you prepared to contribute money to the charitable fund to maintain the fisheries?

DO NOT PROMPT

I think this issue/problem is important	1
I would like to stop the fishing methods disappearing	2
I am very interested in this river/rivers	3
I am very interested in fishing	4
I am very interested in these fishing methods	5
We should keep these methods for other people to enjoy	6
My answer reflects my views on the need to protect all fisheries/fishing methods and not just these ones	7
I like to give to a good cause/get satisfaction from giving to a good cause	8
I will not really have to pay to anything extra	9
I live/have lived in the area/near the river	10
I am English and the Severn is in England	11
I am Welsh	12
I like Wales	13
Other (write in)	14

NOW GO TO SECTION D

SECTION D – REASONS FOR ALLOCATION BETWEEN THE FISHERIES

If the allocation between the Welsh rivers and River Severn AT Q7 was equal i.e. 5 points each go to Q12

If 6 or more points were allocated to the Welsh rivers ask Q10, otherwise go to Q11

Q10 Why did you allocate more money to the fisheries on the 3 Welsh rivers than on the River Severn?

DO NOT PROMPT, CODE TO THE NEAREST ANSWER OR WRITE IN OTHERS

There are less fishing methods on the Welsh rivers	1
As there are only 3/a few coracles left/ a current low level of fishing with traditional methods	2
As there are three rivers and not just one	3
I live in Wales	4
I live near the rivers	5
I am Welsh	6
Like Wales/the Welsh	7
Wales needs greater financial investment generally	8
I know more about these rivers/ have heard of them	9
Other (write in)	10

NOW GO TO SECTION E

Ask Q11 if 6 or more points were allocated to the River Severn estuary

Q11 Why did you allocate more money to the fisheries on the River Severn estuary than on the Welsh rivers?

DO NOT PROMPT, CODE TO THE NEAREST ANSWER OR WRITE IN OTHERS

There are more fishing methods on the Severn to maintain	1
Some of the methods have already gone out of operation	2
The Severn is a large river/covers a large area	3
It is an English river	4
I am English	5
I live near the river/in the area	6
I support money being used in England	7
I know more about this river/ have heard of it	8
Other (write in)	9

NOW GO TO SECTION E

SECTION E

ASK ALL

Q12 How interested would you be in visiting the River Severn fisheries to see the traditional methods of fishing?

READ OUT

Very interested	1
Fairly interested	2
Not very interested	3
Not at all interested	4
Don't know	5

Q13 How interested would you be in visiting the fisheries on the Towy, Tarv or Teivi to see the traditional methods of fishing?

READ OUT

Very interested	1
Fairly interested	2
Not very interested	3
Not at all interested	4
Don't know	5

Q14 The Coracle boats are traditionally made from wood covered with animal hide, but are nowadays usually made from wood covered with fibre glass. The baskets within the Patcher ranks are traditionally made from willow and hazel, but more recently from steel. How important do you feel it is to continue to use the traditional materials for the Coracles and Patcher ranks?

READ OUT

Very important	1
Fairly important	2
Not very important	3
Not important at all	4
Don't know	5

THANK RESPONDENT AND CLOSE INTERVIEW

Appendix 4: population data

	NAME	AREA	POPULATION
	South West Region	20674506613.558	3880979
	Thames	12917001255.815	11098199
	EA Wales	21109907763.049	3065704
	North Wessex - South West	5629116557.700	1603172
	West - Thames	6189662148.183	1382165
	Midlands Region	21600946932.887	8237439
	Sub total		11222776
POSTAREA	POSTTOWN	AREA_KM	POPULATION
B	BIRMINGHAM	1286.80846357000000	1755518.00000000
		0	
CH	CHESTER	1008.70369141000000	653827.00000000
		0	
LL	LLANDUDNO	5501.62056984000000	501009.00000000
		0	
RG	READING	1953.14778402000000	670111.00000000
		0	
SL	SLOUGH	391.830970046760000	317382.00000000

**Category 1
and 2
postcode
areas**

GEO_DIST	COM_DIST	POST_AREA	POST_TOWN	AREA_KM	POPULATION
DY12	DY12	DY	BEWDLEY	81.7528	11401
DY13	DY13	DY	STOURPORT-ON-SEVERN	46.8994	20672
GL 1	GL1	GL	GLOUCESTER	8.4969	27957
GL 2	GL2	GL	GLOUCESTER	161.9158	41733
GL14	GL14	GL	NEWNHAM/WESTBURY-ON-SEVERN/CINDERFORD	92.1853	14710
GL19	GL19	GL	GLOUCESTER	141.1409	8006
GL20	GL20	GL	TEWKESBURY	131.9878	23107
SY 1	SY1	SY	SHREWSBURY	11.8773	22417
SY 2	SY2	SY	SHREWSBURY	9.4372	16684
SY 3	SY3	SY	SHREWSBURY	34.9046	29980
SY 4	SY4	SY	SHREWSBURY	367.5581	21255
SY 5	SY5	SY	SHREWSBURY	451.9950	17568
SY10	SY10	SY	OSWESTRY	467.6447	14726
SY15	SY15	SY	MONTGOMERY	151.7861	4545
SY16	SY16	SY	NEWTOWN	251.6600	14018
SY17	SY17	SY	LLANDINAM/CAERSWS	162.7053	3364
SY18	SY18	SY	LLANIDLOES	264.1351	4265
SY21	SY21	SY	WELSHPOOL	524.4587	15081
SY22	SY22	SY	LLANFYLLIN/LLANSANTFFRAID/MEIFOD/LLANYMYNECH/ LLANFECHAIN	216.2583	6306
SY25	SY25	SY	YSTRAD MEURIG/TREGARON	416.7128	3887
TF 1	TF1	TF	TELFORD	18.8176	29862
TF 2	TF2	TF	TELFORD	24.2133	28342
TF 3	TF3	TF	TELFORD	11.2652	24627
TF 4	TF4	TF	TELFORD	10.2074	12724
TF 5	TF5	TF	TELFORD	5.2391	3196
TF 6	TF6	TF	TELFORD	130.0694	5172
TF 7	TF7	TF	TELFORD	9.9143	18556
TF 8	TF8	TF	TELFORD	15.3003	1853
TF11	TF11	TF	SHIFNAL	124.7299	9625
TF12	TF12	TF	BROSELEY	27.5404	5515
TF13	TF13	TF	MUCH WENLOCK	89.7660	3457

WR 1	WR1	WR
WR 2	WR2	WR
WR 3	WR3	WR
WR 5	WR5	WR
WR 6	WR6	WR
WR 8	WR8	WR
WR 9	WR9	WR
WR13	WR13	WR
WR14	WR14	WR
WV15	WV15	WV
WV16	WV16	WV

WORCESTER	2.6057	6650
WORCESTER	57.1376	27684
WORCESTER	22.0577	19396
WORCESTER	38.5377	24389
WORCESTER	257.8546	11506
WORCESTER	97.4988	7077
DROITWICH	131.6401	27486
MALVERN	109.4672	10496
MALVERN	27.1929	28943
BRIDGNORTH	96.8341	8340
BRIDGNORTH	201.7187	15446

652024

**Category 1
and 2 - EA
Wales**

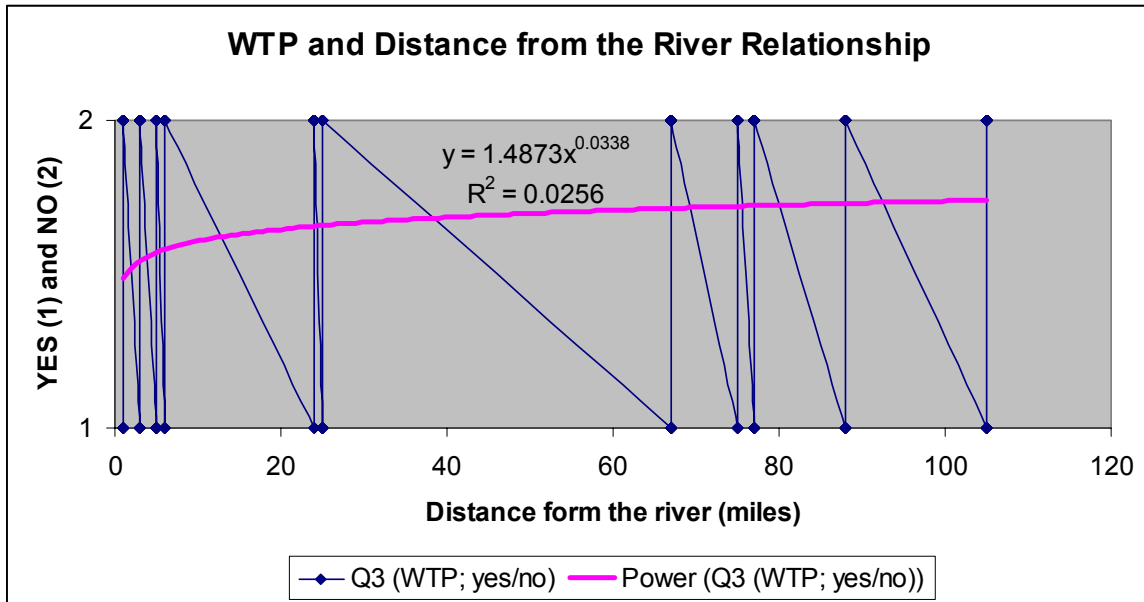
SA34	SA34	SA
SA37	SA37	SA
SA38	SA38	SA
SA39	SA39	SA
SA40	SA40	SA
SA43	SA43	SA
SA44	SA44	SA
SA48	SA48	SA

WHITLAND	163.2035	4755
BONCATH	38.6349	1153
NEWCASTLE EMLYN	98.8348	3886
PENCADER	74.7922	2156
LLANYBYDDER	74.9466	2535
CARDIGAN	175.8193	12040
LLANDYSUL	260.8620	10752
LAMPETER	264.2764	7971

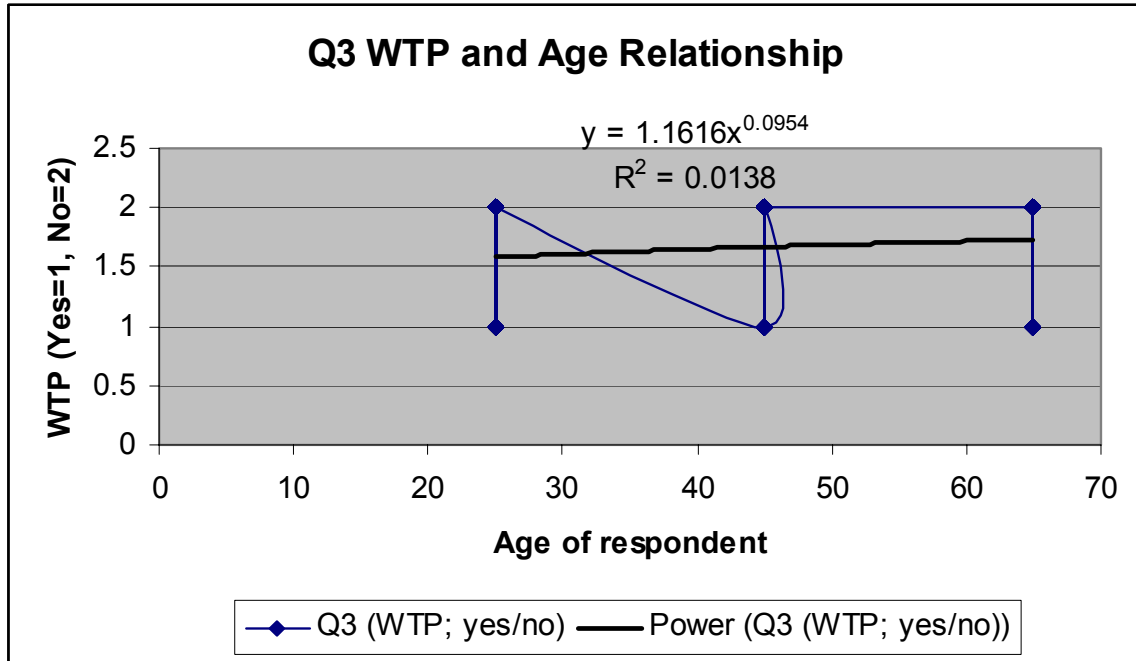
45248

Appendix 5: regression analysis

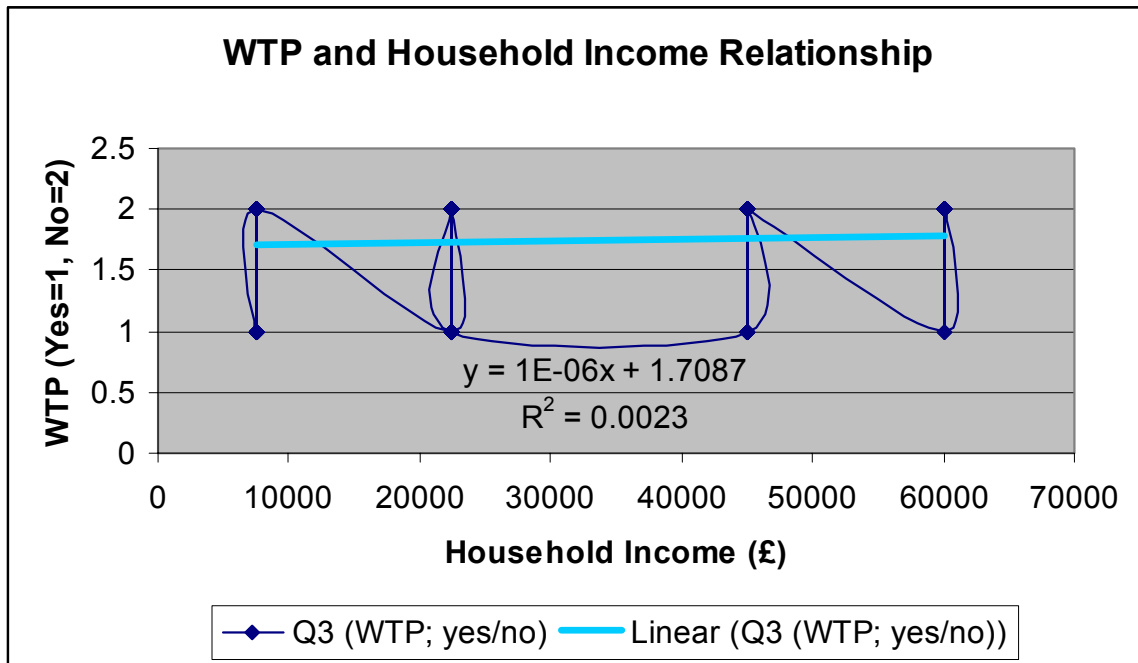
1. Those living closer to the rivers are more likely to say yes, they would be willing to pay to maintain the minimum level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers. However, the coefficient of regression determination indicates that only 2.6% of the distance distribution is explained by the regression line of distance from the river in relation to whether one is willing to pay or not.



3. Younger people are more inclined to say yes to whether to pay to maintain the minimum level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers. In this regression curve case however, even less of the age distribution (1.4%) is explained by the regression line of age of respondent in relation to whether one is willing to pay or not.



4. Those with smaller household income are more inclined to say yes to whether to pay to maintain the minimum level of traditional fishing on the River Severn Estuary or the 3 Welsh rivers. In this instance however, even less of the household income distribution (0.2%) is explained by the regression line of household income of respondent in relation to whether one is willing to pay or not.



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